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A STUDY ON PREVELANCE OF MALARIA IN KURNOOL DISTRICT

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ABSTRACT: BACKGROUND: Malaria affects mainly the poor underserved and marginalized population in remote rural areas which are characterized by inadequate control measures and limited access to health care. Malaria continues to pose a major public health threat in India, particularly due to *P. falciparum* which is prone to complications. **OBJECTIVE:** Study was conducted to know the prevalence of malaria in Kurnool district by age and sex distribution. **METHODOLOGY:** A retrospective study. Information was from the year January, 2008 to July, 2013. **OBSERVATION:** An increasing trend is observed in the prevalence of *P. falciparum*. And there is declining trend in the prevalence of *P. vivax*. There is almost 'zero' prevalence of infection in infants. There is no change in the prevalence of *P. falciparum* among 1-5 yr. age group. There is increasing trend in the prevalence of *P. falciparum* in the age group of 5-14 years from 2008 to 2011. There is no specific trend in *P. falciparum* in adult population. There is a clear cut decline trend in the number of *P. vivax* cases in all age groups. This is comparable with the declining trend of all India prevalence of *P. vivax* cases. The decline may be due to the active anti-malarial measures in the district. Males are affected more than females in both *falciparum* and *vivax* malaria cases. **DISCUSSION:** Increasing trend in the prevalence of *P. falciparum* is due to dense forest around the district and increasing resistance to Chloroquine and declining trend in the prevalence of *P. vivax* is due to the active coverage of DDT by 95.6% in urban area and 89.2% of rural area. 'Zero' prevalence in infants may be due to under reporting. There is no change in the prevalence of *P. falciparum* among 1-5 yr. age group and increasing trend in the prevalence of *P. falciparum* in the age group of 5-14 years from 2008 to 2011 may be due to the children in this age group (5-14) playing outside in the evening period. There is a clear cut decline trend in the number of *P. vivax* cases in all age groups which is comparable with the declining trend of all India prevalence of *P. vivax* cases. Males are affected more than females due to the different occupational habits. Males do have more outdoor activities. There is a drastic decline in cases from 2008 to 2012 which supports the national values. API of Kurnool district is less than 2 shows a decline in the disease prevalence. **CONCLUSION:** In Kurnool district *P. vivax* is more prevalent than *falciparum*. Male to female ratio in Kurnool district is 1: 0.76. Male to female ratio in Kurnool district is 1: 0.76. ABER of Kurnool dist. from 2008 to 2012 is 12.47 to 11.72.

KEYWORDS: *P. falciparum*, *P. vivax*, underserved and marginalized.

INTRODUCTION: Malaria remains one of the most widespread, potentially fatal infectious disease.¹

Each year an estimation of 300-500 million clinical cases of malaria occur, making it one of the most prevalent infectious disease.² Malaria is one of the major health problems of the country. Around 1.5 million laboratory confirmed cases of malaria are annually reported is due to *p. falciparum*. One of the reasons attributed to rise in proportion of *p. falciparum* cases is resistance to chloroquine, which was used for a long time as a first line of treatment of malaria cases.

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Kurnool district (AP) has a mid-year population of 41,81,052 (2013) with average rain fall of 40-60 cm humidity ranging from 40-60% temperature ranging from 18^o- 43^oC which all favors vector growth i.e. mosquito.

METHODOLOGY: Study Design: A retrospective study. Information about the total Number of Malaria cases were collected from the office of the District Medical and Health Officer, Kurnool District Information was from the year January, 2008 to July, 2013. Data consisted of Age and sex distribution, total number of slides examined, total number of Malaria positive cases, total number of slides positive for vivax, total number of slides positive for falciparum.

OBSERVATIONS:

Period	Total No. of slides examined among the District Population		Positive for Malaria		Positive for Plasmodium falciparum		Positive for Plasmodium vivax	
	No.	%	No.	%	No.	%	No.	%
2008	4,87,237	(12.47)	627	(0.13)	147	(23.44)	480	(76.56)
2009	4,85,397	(12.26)	415	(0.09)	84	(20.24)	331	(79.76)
2010	4,48,701	(11.19)	279	(0.06)	89	(31.90)	190	(68.10)
2011	4,56,665	(11.24)	264	(0.06)	106	(40.15)	158	(59.85)
2012	4,83,761	(11.72)	233	(0.05)	126	(54.08)	107	(45.92)
2013 upto July	2,96,434	(7.09)	104	(0.04)	39	(37.50)	65	(62.50)

Table1: Showing prevalence of malaria

In table 1 it shows that as years are going on the percentage of p. falciparum is increasing whereas P. vivax cases are declining. As years are going on no. of cases are in declining order.

Age	P. falciparum Positive									
	Total		<1 yr.		1-5 yrs.		5-14 yrs.		Above 14 yrs.	
	No.	%	No.	%	No.	%	No.	%	No.	%
2008	147	(23.44)	1	(0.7)	5	(3.4)	21	(14.29)	120	(81.6)
2009	84	(20.24)	0	(0.0)	4	(4.8)	28	(33.3)	52	(61.9)
2010	89	(31.90)	0	(0.0)	3	(3.4)	26	(29.2)	60	(67.4)
2011	106	(40.15)	0	(0.0)	6	(5.7)	43	(40.6)	57	(53.8)
2012	126	(54.08)	0	(0.0)	6	(4.8)	39	(31.0)	84	(66.7)
2013 upto July	39	(37.50)	0	(0.0)	2	(5.1)	6	(15.4)	31	(79.5)

Table2: age wise prevalence of p.falciparum

Table 2 shows that there is almost 0%percentage of infection in infants. Declining trends in adult population. There is no change in the % of 1-5 & 5-14years age group.

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Period	No of positives		<1 yr.		1-5 yr.		5-14 yr.		>14 yr.	
Year	No.	%	No.	%	No.	%	No.	%	No.	%
2008	480	(76.6)	0	(0.0)	16	(3.3)	103	(21.5)	361	(75.2)
2009	331	(79.8)	0	(0.0)	22	(6.7)	95	(28.7)	214	(64.7)
2010	190	(68.1)	0	(0.0)	21	(11.1)	77	(40.5)	92	(48.4)
2011	158	(59.9)	0	(0.0)	8	(5.1)	68	(43.0)	82	(51.9)
2012	107	(45.9)	0	(0.0)	7	(6.5)	37	(34.6)	63	(58.9)
2013 upto July	65	(62.5)	0	(0.0)	3	(4.6)	24	(36.9)	38	(58.5)

Table 3: Age wise prevalence of P.vivax

In table 3 we can see declining trend in the prevalence of P. vivax in all age groups.

Period	Total Positive		Male		Female	
YEAR	No.	%	No.	%	No.	%
2008	147	(23.4)	85	(57.8)	62	(42.2)
2009	84	(20.2)	58	(69.0)	26	(31.0)
2010	89	(31.9)	63	(70.8)	26	(29.2)
2011	106	(40.1)	59	(55.7)	47	(44.3)
2012	129	(54.1)	79	(61.2)	50	(38.8)
2013 up to July	39	(37.5)	27	(69.2)	12	(30.8)

Table 4: Prevalence of P. falciparum-sex wise

Period	Total positive		Males		Females	
Year	No.	%	No.	%	No.	%
2008	480	(76.6)	258	(53.8)	258	(53.8)
2009	331	(79.8)	162	(48.9)	162	(48.9)
2010	190	(68.1)	111	(58.4)	111	(58.4)
2011	158	(59.9)	82	(51.9)	82	(51.9)
2012	107	(45.9)	63	(58.9)	63	(58.9)
2013 upto July	65	(62.5)	38	(58.5)	38	(58.5)

Table 5:Prevalence of P.vivax-sex wise

In table 4 & 5 we can observe that males are more affected than females in all years.

PERIOD	Total no of slides examined	Positive for malaria	API
2008	4,87,237	617	1.27
2009	4,85,397	415	0.86
2010	4,48,701	279	0.62
2011	4,56,665	264	0.58
2012	4,83,761	233	0.48
2013 upto July	2,96,434	104	0.35

Table 6:ANNUAL PARASITE INCIDENCE (API)

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In table 6 it clearly shows that the API of Kurnool dist. is declining as years are passing on.

PERIOD (Year)	TOTAL NO. OF SLIDES EXAMINED	Mid-Year Population of Kurnool District	ABER
2008	4,87,237	39,06,984	12.47
2009	4,85,397	39,58,695	12.26
2010	4,48,701	40,10,406	11.19
2011	4,56,665	40,62,117	11.24
2012	4,83,761	41,29,341	11.72
2013 upto July	2,96,434	41,81,052	7.09

Table 7:ANNUAL BLOOD EXAMINATION RATE (ABER)

In table 7 it clearly shows that there is declining trends in ABER as years are passing on.

DISCUSSION: In Kurnool district *P.vivax* is more prevalent than *p.falciparum*. This was in agreement with other previous studies.^{4,5} Where in studies done by Addidabeba, K. Y. Asnakew et.al, D. Sintasath, T. A. Ghebreyesus et.al, K. Karunamoorthi et.al, J. M. Ramos et.al, reported that the most prevalent species was *P. falciparum*, followed by *P. vivax*.⁶⁻¹¹ As the years are passing on there is declining trends in malaria cases which is seen as same pattern in some region like ethopia.¹² Males were more infected than females, which was statistically significant. This is in line with the other previous studies.¹³⁻²¹ Male to female ratio in Kurnool district is 1:0.76.

Whereas studies done by Aswani kumar et.al it is 1:0.56.³The actual incidence is definitely far more than presently known. the reason attributed to such gap are deficiencies in coverage, collection and examination of blood smears and reporting system²¹⁻²⁶.Male to female ratio in Kurnool district is 1: 0.76.

As supportive in work done by Addis ababa.¹² As per the NVBDCP incidence records, in most of India, the API was <2, whereas 2–5 API was in scattered regions, and regions with >5 API were scattered in the states of Rajasthan, Gujarat, Karnataka, Goa, Southern Madhya Pradesh, Chhattisgarh, Jharkhand, and Orissa and in northeastern state³. ABER of Kurnool district from 2008 to 2012 is 12.47 to 11.72. Where as in other studies it showed that the average ABER was 9% in India. In 14 of 29 states, however, it ranged from 1% to 8%, and in the remaining 15 states and union territories, ABER ranged from 10% to 40%.³

CONCLUSION: An increasing trend is observed in the prevalence of *P. falciparum*. It may be due to dense forest around the district and increasing resistance to Chloroquine. There is declining trend in the prevalence of *P. vivax*. It may be due to the active coverage of DDT by 95.6% in urban area and 89.2% of rural area. There is almost 'zero' prevalence of infection in infants may be due to under reporting, most of the time mother will be beside child which she won't allow mosquito bite and positive impact of Health Education on Malaria.

Prevalence of *P.falciparum* is variable in different age groups. There is no change in the prevalence of *P.falciparum* among 1-5 yr. age group and There is increasing trend in the prevalence of *P.falciparum* in the age group of 5-14 years from 2008 to 2011 may be due to the children in this age group (5-14) playing outside in the evening period; hence mosquito bites are common there is

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decline from 2011 onwards may be due to preventive measures awareness. There is no specific trend in *P.falciparum* in adult population. There is a clear cut decline trend in the number of *P.vivax* cases in all age groups. This is comparable with the declining trend of all India prevalence of *P.vivax* cases. The decline may be due to the active anti-malarial measures in the district.

Males are affected more than females in both *falciparum* and *vivax* malaria cases due to the different occupational habits. Males do have more outdoor activities and number of working hours will be more when compared to females. There is a drastic decline in cases from 2008 to 2012 which supports the national values. API of Kurnool district is less than 2 during the past 5 years. This shows a decline in the disease prevalence.

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