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Situational analysis of malaria in Ahmedabad city (India)

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ABSTRACT

Introduction Malaria is one of the major public health problems in India. Malaria cases are on rise in major cities including Ahmedabad owing to rapid urbanization, industrialization and humidity. Monsoon patterns are changing due to global warming. Present study was carried out to analyze the situation of malaria in 2011 in selected wards of Ahmedabad in purview of NVBDCP. Methodology Field areas (urban slums) catered under public health service delivery of total 3 wards of south and east zones under AMC (population worth about 3 lakhs) were selected based on systematic random sampling. Situational analysis was done based on the locally adapted tool from national guidelines. Results More than 95% of smears were positive for P. vivax parasite with highest total positivity reporting from Isanpur (38.24%). Parasite incidence was highest in Danilimda (0.64 per 1000). RT completion was least in Amraiwadi (51.11%). Procurement of contact smears was not a uniform practice. The SPR was highest in Isanpur for both active and passive surveillance (7.14% and 2.11% respectively). MBER was highest throughout in Danilimda and lowest in Isanpur. Results were conveyed to the patients within 24 hours by all laboratories except the one of Danilimda ward. ACT packs for children were not available at Amariawadi. No injectable medicines were available at any of the centres. Knowledge about dilution process of the abate solution amongst link workers was faulty. ConclusionAPI more than 2 is an indication for starting IRS activities. Urgent measures are required to improve MBER and eventually ABER. Incomplete RT owing to loss of follow-up issues needs to be addressed with implementation of line-listing. Area of contact smears need to be emphasized upon. The slide positivity rate of active surveillance is significantly lower suggesting poor quality of active surveillance. Quality assurance of blood smear examination should be more stringent. Sufficient stock of medicine has to be ensured at all the centres specially during high transmission season.

Introduction

After sub-Saharan Africa having the highest burden of malaria cases and deaths, in Asia, India is one of the badly affected country in terms of vector-borne diseases especially malaria [1], Malaria is one of the major public health problems in the country. There are about 216 million cases of malaria (with an uncertainty range of 149 million to 274 million) and an estimated 655 000 deaths in 2010 (with an uncertainty range of 537 000 to 907 000). [1] Approximately 2 to 3 million new cases of malaria arise every year and it still remains the most important cause of morbidity and mortality in India. [2] l All preventive and control measures for vector-borne diseases are implemented through National vector borne disease control program (NVBDCP) in India and the programme is vertically implemented nation-wide.

Around 1.5 million laboratory confirmed cases of malaria are annually reported in India. In Gujarat, 89764 malaria cases were reported in 2011 with 127 deaths with 17.9% of them being P. falciparum (Pf) cases. In Ahmedabad city the number of cases was 7,158 with P. Falciparum cases 1265 and percentage being 17.7% [3]. Death audit of malarial deaths in the year of 2011 revealed that majority of the cases reaching tertiary healthcare settings were already complicated in nature. [4]

Ahmedabad is the financial capital of Gujarat state worth 6 million population and one of the biggest as well as fastest developing cities in India. Rapid urbanization, immense industrialization and constantly humid temperature are some of the factors responsible for mosquito breeding and resultant urban epidemic of malaria. Government healthcare delivery and implementation of NVBDCP in the urban areas are through 56 Urban Health Centers spread in 6 zones.

Vectors for malaria are species of anopheline mosquitoes. Generally, the vector breeding increases during transmission seasons which is considered to be the rainy season. Transmission season for malaria in the city of Ahmedabad is believed to be from May to August. Monsoon patterns in the country are changing which might be the result of global warming. With changing trends in monsoons, breeding patterns of vectors are also assumed to be changing. Radical treatment of malaria cases in accordance with national guidelines is the mainstay to curb the menace.

Present study was carried out to analyze the situation of malaria in selected wards of 3 zones of Ahmedabad city in context of national guidelines.

METHODOLOGY

Study design, area and duration

Almost 6 million of population of the metro city of Ahmedabad is catered by 6 different geographical zones. More than half of

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the city population is slum. Ahmedabad Municipal Corporation (AMC) takes care of the healthcare service delivery in these areas through Urban Health Centers (UHCs). Private practitioners also render their services to the population.

Field areas catered under public health service delivery from randomly selected two zones of AMC namely South and East were covered in the surveillance activities based on systematic random sampling. Selection of wards was in accordance with procured information from the local health authorities about high-malaria case reporting in previous 2 quarters. The surveillance data were collected from September 2011 onwards from Isanpur & Danilimda wards of South Zone and Amraiwadi ward of East Zone of AMC.

All field practice areas of the UHCs were visited by the medical professionals with entomological expertise of AMC MET Medical College and LG Hospital (Ahmedabad).

Study tool
The tool which was used for surveillance purpose was adopted from NVBDCP operational guidelines manual with modifications wherever required as per local scenario. Local healthcare machinery including administrative and service delivery personnel were contacted and interviewed.

Study variables
Radical treatment, malariometric indices, logistics in malaria programme, mosquito breeding

Analysis
Data entry was done in MS Excel and analysis was carried out in MedCalc v10.

RESULTS
Majority (96.7%) of smears in all the surveyed wards were positive for P. vivax parasite. No case of mixed infections was reported.

Highest total positivity was reported from Isanpur (38.24%), followed by Amaraiwadi (34.19%). P. vivax proportions remained the same in ward-wise distribution. P. falciparum was reported highest in Isanpur (44.44%).

Cumulative statement of blood smears examined and positive for P.vivax and P. falciparum from April onwards in the wards visited is given in Table 1.

Table 1: Cumulative statement of blood smear examined, Pv% and Pf% (April to Sept. 2011)

Sr. No.	Ward	Blood smears examined	Total positive		Pv positive		Pf positive		Parasite incidence	Status of Radical Treatment in Pv cases
			n	%	n	%	n	%		
1	Isanpur	3123	104	38.2%	100	38%	4	44.4%	0.60 per 1000 population	100/100 (100%)
2	Danilimda	8885	75	27.6%	73	27.8%	2	22.2%	0.64 per 1000 population	61/73 (83.56%)
3	Amraiwadi	2429	93	34.2%	90	34.2%	3	33.3%	2.1 per 1000 population	46/90 (51.11%)
Total		14437	272	100.00%	263	100.00%	9	100.00%	--	207/263 (78.71%)

Parasite incidence for the period of April to September for all the wards showed that Amraiwadi ward had parasite incidence of more than 2.

92.9% patients completed RT in South Zone. RT was given in 51.11% of the total Pv cases in Amraiwadi while it was given to all Pv cases in Isanpur. Major reasons for non-completion of RT were referral to other ward, migration and private hospitalization. (Table 1) The details of the patients who received radical treatment in last one month were collected by personal interview in field.

Contact smears were taken in the Isanpur ward but in rest of the wards either they were not taken or were taken for few cases only. The practice of obtaining follow-up smear from the case of malaria was found inadequate.

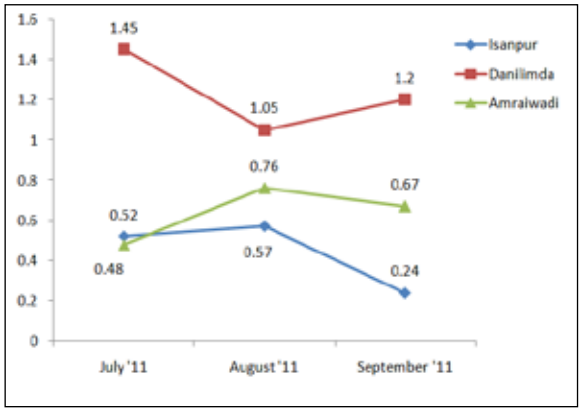
The slides collected by active and passive surveillance and their positivity were as per Table 2. The SPR by passive surveillance in all surveilled wards ranged between 2.41% to 7.14% with highest in Isanpur ward. SPR of active surveillance ranged between 0% to 2.11% which is much lower.

Table 2: Active v/s passive surveillance for blood smear examination (April to Sept. 2011)

Ward	Active surveillance			Passive surveillance		
	No. Examined	No. Positive	SPR (%)	No. Examined	No. Positive	SPR (%)
Isanpur	2367	50	2.11	756	54	7.14
Danilimda	5774	0	0.00	3111	75	2.41
Amraiwadi	1122	7	0.62	1307	86	6.58

Monthly Blood examination rates (Active as well as passive surveillance) for all the three wards are as shown in chart I. Isanpur and Amariawadi wards are having very low MBER as against the norm of 1.2% during transmission season (as per NVBDCP guidelines).

Chart I: Ward-wise Monthly Blood Examination Rate (MBER%) for the study quarter



All the laboratories were checked as per guidelines of NVBDCP and all were found well-equipped as per those guidelines. Results were conveyed to the patients within 24 hours by all laboratories except the one of Danilimda ward (66.7% for south zone). Backlog of slide in south zone was reported to be 33.33%. There was no written documentation of the slides sent for cross-checking (All positive and 2% of negative slides) as per interview of the laboratory technicians. The results were not conveyed in writing to the urban health centres by cross-checking facilities. However, discrepancy rate was 0% for south zone.

Among the drug stocks verified, ACT packs for children were not available at Amariawadi. No injectable medicines were available at any of the centres. Tablet chloroquine stocks were sufficient at all the urban health centres. At Amariawadi, primaquine tablets for adults were not available.

Link workers were not aware about dilution process of the abate solution which is provided to them but MPHW could demonstrate the same.

CONCLUSION

API more than 2 is an indication for starting IRS activities. However in all the wards the slum areas having API more than 2 should be identified for IRS activities. Urgent measures are required to improve MBER and eventually ABER which can give clear ideas about API and the progress made.

Incomplete RT owing to loss of follow-up issues can be taken care of by noting full address of patients, other contact details and following transfer in and out strategy as it is there in RNTCP. Defaulters can be minimized by follow-up of patients even in other wards.

Contact smears are quintessential in terms of complete treatment and thorough cure. Inadequacy of the same needs to be addressed and this part of the program needs emphasis.

The difference in slide positivity rate between active and passive surveillance is statistically highly significant. The slide positivity rate of active surveillance is significantly lower suggesting poor quality of active surveillance. The faulty smear collection, storage and transportation are probably responsible for this as was obvious from the real-time observations.

Maintaining the quality MBER of 1.2% during high transmission season and 0.8% during rest of the year by active and passive surveillance can give us clear picture of parasite incidence and early detection of cases from the community.

The reporting and documentation of cross-checking can be improved and some random number can be given every month for selecting negative slides for cross-checking.

Sufficient stock of medicine has to be ensured at all the centres specially during high transmission season. Better liaison with CMSO for that matter is required.

Sensitization of the private practitioners, intensive active surveillance, regular field visits by peripheral staff, community awareness and early referral are possible solutions to this.

Aggressive IEC/BCC measures to sensitize the local slum population towards vector borne diseases are required.

STUDY LIMITATION

The study population comprised only that of the urban slums. Studies covering non-slum population also should be carried out in order to have a broader picture for effective control of vector-borne diseases.

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CONFLICT OF INTEREST

Nil. The study was neither funded nor financially assisted by any organization or agency.

REFERENCE

1. Malaria, Fact sheet N°94 April 2012, available at: www.who.int/mediacentre/factsheets/fs094/en/index.html Accessed on July 7th, 2012 | 2. Sharma VP. Current scenario of malaria in India. Parasitology 1999; 41: 349–53 | 3. Media report; available on: http://articles.timesofindia.indiatimes.com/2012-10-28/ahmedabad/34780099_1_dengue-cases-disease-control-programme-dengue-and-other-mosquito | 4. Vyas S, Solanki A, Joshi U, Nayak H. Death Audit of Deaths Due to Malaria At LG Hospital, Ahmedabad (Gujarat) During The Year 2011. 2012;3(2):352-356