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URBAN MALARIA: VIJAYAWADA'S PROGRESS TO HALT MALARIA BY 2015

Kolli Sree Karuna Murthy¹, Harika Surabathula², Bhaskari Kolli³

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ABSTRACT: Malaria is a disease infecting and affecting the mankind by the way of morbidity and mortality and man day's loss and there by affecting the economy of the people. There is slow progress in the improvement of health indicators related to mortality, morbidity, and various environmental factors contributing to poor health conditions. Urban Malaria is a challenge to the health providers and especially it is very difficult to control the mosquitoes in the slums. The Indian Government has started Urban Malaria scheme in 15 Cities depending on the Malaria load. Among these, two cities are in Andhra Pradesh, one being Vishakha Patnam and the other, Vijayawada. Attempts were made to bring down the malaria to stand still and make the city as Malaria Free Vijayawada. The objectives of the study are to study the progress in achieving MDG 6 and to recommend for the fast achievement of the target. The data is collected from the records of Malaria department of the Vijayawada and statistically analyzed by using Microsoft excel. There is a great improvement in reduction of incidence and mortality due to Malaria. The detailed analysis will be displayed in the conference.

KEYWORDS: Urban Malaria, Malaria free Vijayawada, MDG-6.

INTRODUCTION: Malaria in urban areas was considered to be a marginal problem restricted to mega towns only and was considered that local bodies are capable of handling it. Therefore while launching the National Malaria Eradication Programme in 1958, Urban Malaria was not included. By 1970s, incidence of rural malaria came down drastically i.e. 0.1 to 0.15 million cases per year but the urban town reported rising trend.

Madhok Committee in 1970 investigated the problem and assessed that 10 to 12% of total cases were contributed by urban areas. The committee recommended anti larval measures for containment of urban malaria, because it was feared that proliferation from urban to rural may spread and nullify the gains already made.

HISTORICAL BACKGROUND: The control of malaria in the urban areas was thought of an important strategy as a programme complimentary to the NVBDCP for rural areas. Modified Plan of Operation (MPO) was designed and submitted to the Cabinet to tackle the malaria situation in both urban and rural areas in the country simultaneously.

Under MPO, it was decided to initiate anti-larval and anti-parasitic measures to abate the malaria transmission in urban areas. The proposal to control malaria in towns named as Urban Malaria Scheme was approved during 1971 and it was envisaged that 131 towns would be covered under the scheme in a phased manner.

This scheme was sanctioned during November, 1971 and the expenditure on this scheme is treated as plan expenditure in centrally sponsored sector. The central assistance under this scheme was treated 100 per cent grant to the State Governments in kind.

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At present, Urban Malaria Scheme is protecting 130.3 million populations from malaria as well as from other mosquito borne diseases in 131 towns in 19 States and Union Territory. Malaria-a major public health problem:

- 1.5 million confirmed cases are reported annually(NVBDCP)
- 40–50% is due to Plasmodium falciparum.
- Urban Malaria - A challenge?
 - Urban malaria Scheme-implemented in 15 cities.
 - In Andhra Pradesh-2 cities (Vijayawada and Visakhapatnam).
- Vijayawada provides accommodation for more than a million people with beautiful atmosphere with number of hills and river and also multiple canals-habitations for trillions of mosquitoes.
- Attempts were made to bring down the Malaria to standstill and make the city as Malaria Free Vijayawada.

Control Strategies under Urban Malaria Scheme:

Under the scheme, Malaria Control strategy will comprise of (i) Parasite control & (ii) Vector control.

- i. **Parasite control:** Treatment is done through passive agencies viz. hospitals, dispensaries both in private & public sectors and private practitioners. In mega cities malaria clinics are established by each health sector/ malaria control agencies viz. Municipal Corporations, Railways, Defence services.
- ii. **Vector control comprises of the following components**
 - Source reduction.
 - Use of larvicides.
 - Use of larvivorous fish.
 - Space spray.
 - Minor engineering.
 - Legislative measure.

The control of urban malaria lies primarily in the implementation of urban byelaws to prevent mosquito breeding in domestic and peri-domestic areas, or residential blocks and government/commercial buildings, construction sites. Use of larvivorous fish in the water bodies such as slow moving streams, lakes, ornamental ponds, etc. is also recommended. Larvicides are used for water bodies, which are unsuitable for use of larvivorous fish. Awareness campaigns are also undertaken by Municipal Bodies/Urban area authorities.

The control measures recommended under UMS are as below:

- a. **Source reduction (Guidelines for Source Reduction):** Environmental methods of controlling mosquito breeding including source reduction minor engineering works, by filling ditches, pits, low lying areas, streamlining, canalizing, desilting, deweeding, trimming of drains, water disposal and sanitation, emptying water containers once in a week and observing weekly Dry Day etc.

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b. Anti-larval Methods:

Chemical: Recurrent anti-larval measures at weekly intervals with approved chemical larvicides to control the vector mosquitoes are recommended. The following chemical larvicides are used in the Urban Malaria Scheme programme:

- Temephos.
- Bti (WP & 12 AS).

Biological Control (Guidelines for Larvivorous fish): In some urban areas larvivorous fish like Gambusia and Guppy are also used in certain situations where the chemical control is not feasible. Biological larvicide, *Bacillus thuringiensis israelensis* either wettable powder or aqueous suspension are also used for control of aquatic stages of vector mosquitoes.

Aerosol Space Spray: Space spraying of pyrethrum extract (2%) in 50 houses in and around every malaria and dengue positive cases to kill the infective mosquitoes is recommended.

iii. Personal Prophylactic Measures that individuals/communities can take up:

- Use of mosquito repellent creams, liquids, coils, mats etc.
- Screening of the houses with wire mesh.
- Use of bed nets treated with insecticide.
- Wearing clothes that cover maximum surface area of the body.

iv. Community Participation

- Sensitizing and involving the community for detection of *Anopheles* breeding places and their elimination.
- NGO schemes involving them in programme strategies.
- Collaboration with CII/ASSOCHAM/FICCI.

v. Environmental Management & Source Reduction Methods

- Source reduction i.e. filling of the breeding places.
- Proper covering of stored water.
- Channelization of breeding source.

vi. Monitoring and Evaluation of the programme

- Monthly Computerized Management Information System (CMIS).
- Field visits by state by State National Programme Officers.
- Field visits by Malaria Research Centres and other ICMR Institutes.
- Feedback to states on field observations for correction actions.

Emerging Problem of Malaria in Urban Areas:

1. The proportion of urban population to the total population has increased in the last few decades. This has been triggered by rural “push” (for earning livelihood and “urban pull” (for availing both medicare/ education opportunities) phenomenon.

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2. Haphazard and unplanned growth of towns has resulted in creation of “urban slum” with poor housing and sanitary conditions promoting vector mosquito breeding potential for malaria, filaria and dengue fever/ Dengue haemorrhagic fever.
3. Restricted water supply has led to water storage practices in artificial containers which have generated breeding potential of An. Stephensi vectors of urban malaria and Aedes aegypti, the vector of DF/DHF.
4. With rapid growth of population in urban towns, existing staff strength has not corresponding strengthening and is therefore inadequate for service delivery.
5. Anti-larval activities are restricted to chemical control. The focus is not on integrated source reduction measures.
6. Towns not under UMS are also contributing maximum malaria cases in Mangalore.
7. Due to population pressure all cities are expanding and parallel cities have come up and epidemic situations prevail. Gurgaon, Navi Mumbai, Noida.
8. Old villages in expanding urban centres were kept out of overall development (sullage & sewage disposal) with unrestricted land use maintain high mosquito genic potential.
9. Development project activities without health impact assessment have resulted in malaria outbreaks in short terms and endemic malaria with foci of P. falciparum resistance strains in long term.

SYMPTOMS OF SEVERE AND COMPLICATED MALARIA: The priority requirement is the early recognition of signs and symptoms of severe malaria that should lead to prompt emergency care of patient. The signs and symptoms that can be used are non-specific and may be due to any severe febrile disease, which may be severe malaria, other severe febrile disease or concomitant malaria and severe bacterial infection.

The symptoms are a history of high fever, plus at least one of the following:

- Prostration (inability to sit), altered consciousness lethargy or coma.
- Breathing difficulties.
- Severe anaemia.
- Generalized convulsions/fits.
- Inability to drink/vomiting.
- Dark and/or limited production of urine.

Patients with prostration and/or breathing difficulties should, if at all possible, be treated with parenteral antimalarials and antibiotics. Oral treatment should be substituted as soon as reliably possible. Frequent monitoring of laboratory parameters is essential - blood sugar, blood urine, fluid balance, associated infection, etc. Drugs that increase gastro intestinal bleeding should be avoided.

SIGNS OF SEVERE AND COMPLICATED MALARIA:

- Cerebral malaria, defined as unarousable coma not attributable to any other cause in a patient with falciparum malaria.
- Generalized convulsions.
- Normocytic anaemia.

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- Renal failure.
- Hypoglycaemia.
- Fluid, electrolyte and acid-base disturbances.
- Pulmonary oedema.
- Circulatory collapse and shock ("algid malaria").
- Spontaneous bleeding (disseminated intravascular coagulation).
- Hyperpyrexia.
- Hyperparasitaemia.
- Malarial haemoglobinuria.

RISK FOR SEVERE COMPLICATIONS:

- In areas of low transmission - all age groups are vulnerable but adults develop more severe and multiple complications. The transmission pattern in most parts of India is usually low, but intense transmission is seen in north-eastern states and large areas of Orissa, Chattisgarh, Jharkhand and Madhya Pradesh.
- In areas of high transmission - children below 5 years, visitors, migratory labour.
- Association of pregnancy-pregnant women are less capable of coping with and clearing malaria infections, adversely affecting the unborn foetus.

OBJECTIVES:

1. To assess the annual parasite incidence since 1990 in Vijayawada.
2. To assess the proportion of Falciparum cases among malaria patients in Vijayawada since 1990.
3. To compare the data with that of national values.

METHODOLOGY:

- Secondary data regarding blood smear collection and Malaria incidence in Vijayawada city from 1990-2011 is collected from the District Malaria Office of Krishna district.
- Data entered in Microsoft excel and presented in the form of Annual parasite incidence and proportions.

RESULTS:

Period	1990	1995	2000	2005	2010
National API	2.57	3.29	2.09	1.68	1.3
API in Vijayawada	13.6	25.2	9	7.5	3.2

Table-1: Comparison of API at National and API in Vijayawada

Period	1990	1995	2000	2005	2010	2011
Slide Positivity Rate	7.5	12.1	3.7	3.5	1.7	1.3

Table-2: Slide Positivity Rate in Vijayawada

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Period	1990	1995	2000	2005	2010
National		38.84	51.54	44.32	52.12
Vijayawada	0.61	6.07	4.4	3.52	6.48

Table-3: Proportion of Plasmodium Falsiparum
Comparison between the National and Vijayawada figures

CONCLUSIONS:

Trend of the malaria prevalence in Vijayawada indicates that it may reach the baseline by 2015 with the implementation of effective preventive measures. The proportion of falciparum cases are much less compared to national averages which is a welcoming sign.

RECOMMENDATIONS:

- There should be strong community participation and behaviour change components in the malaria control program to meet the challenges in malaria.
- Eliminating local reservoirs of mosquitoes.
- Capacity strengthening of community health workers-ASHA.

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AUTHORS:

1. Kolli Sree Karuna Murthy
2. Harika Surabathula
3. Bhaskari Kolli

PARTICULARS OF CONTRIBUTORS:

1. Assistant Professor, Department of Community Medicine, Dr. PSIMS & RF, Chinaoutpalli, Gannavaram, Krishna District, Andhra Pradesh, India.
2. Medical Student, Department of Community Medicine, Dr. PSIMS & RF, Chinaoutpalli, Gannavaram, Krishna District, Andhra Pradesh, India.
3. Post Graduate Student, Department of Community Medicine, Dr. PSIMS & RF, Chinaoutpalli, Gannavaram, Krishna District, Andhra Pradesh, India.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Kolli Sree Karuna Murthy,
Flat-502, Kamala Residency,
Currency Nagar, Vijayawada-520008,
Andhra Pradesh.
Email: kollisreekaruna@gmail.com

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