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Epidemiological investigation of Malaria outbreak among people residing near RHTC of a Tertiary care Hospital in Amroha, Uttar Pradesh

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ABSTRACT: Introduction: Vector Borne diseases such as Malaria have emerged as a serious public health problem in South East Asian regions including India causing considerable morbidity & mortality.
Research Question: What are epidemiological factors responsible for malaria outbreak in Amroha district of Uttar Pradesh.
Objective: To find out the epidemiological factors responsible for outbreak of malaria in Amroha district of Uttar Pradesh & study the knowledge attitude and practice (KAP) of slide positive malaria patients
Study Design: Cross sectional study
Method: First a base line survey was done to explore demographic profile of the study area followed by house hold survey to find out the slide postivity rate (SPR) of the population followed by study of KAP of those found positive
Results & Conclusion: Study population belonging to 15-45 years age group comprising 48.76% was found to be more vulnerable to malaria. The study finds out Malaria, Fever rate, SPR, SFR, KAP of study population regarding malaria. We observed technical complexity, cost, logistic needs, complacency, environmental concerns, lack of timely actions and improper monitoring as the factors responsible for improper implementation of various malaria control strategies. Economic problems, lack of knowledge, casual attitude of people were detected as the cause of malaria in the study area.
Statistical analysis: Rate, Proportions.
Key words: Malaria, bloods smear examinations, fever rate, slide postivity rate, knowledge, attitude and practice

I. INTRODUCTION

Vector borne diseases accounts for approximately 17% of the estimated global burden of infectious diseases. [14] Uttar Pradesh state has been experiencing some emerging disease & some mutations in the pattern of appearance also, events like heavy rains, droughts, cyclone have brought some additional disease burden due to their genetic nature as well as due to some in direct effect like population movement also. [1] Incidence of plasmodium falciparum positive malaria cases is continuously rising since many years in India. Inadequate reporting , particularly in areas known to be highly endemic and often out of reach of well established health services , make it difficult to obtain accurate information on the incidence of the disease. The most effective strategy of malaria control is "early diagnosis & prompt treatment".[18] Light microscopy of well stained thick & thin smear by skilled microscopist has remained the gold standard for malaria diagnosis,[9] timing of sample collection should be as soon as malaria is suspected , it can be collected at any time , irrespective of fever or not necessarily at the height of fever , collection should be before administration of anti malarial drugs which causes detection of parasites difficult due to its morphological alteration, [10] smear should be prepared soon after collection which enables better adherence of film slide & cause minimal distortion of parasite & red cells , smear should be examined with 100x oil immersion objective, a minimum of 100 fields should be examined. [11] In case of mixed infections often one species suppresses the other making detection of suppressed one difficult [12] ,it was estimated in 2002 coverage of target population stood 31% for malaria treatment while for prevention was only 2%[15], with this background present study was carried out to find out the incidence of malaria by doing blood smear examination.

II. MATERIALS & METHODOLOGY

First base line survey was conducted to know the socio demographic profile of the area by four health workers from October to December 2019. In the same year in November suddenly there was increase of malaria case in medicine OPD. Though antimalarial was given to all patients but

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primaquine was not given because of the reason they informed that they are not having facility of glucose 6 phosphate dehydrogenase deficiency test. After knowing this PSM deptt started house to house survey from 9/11/19 to 26/11/19 by two laboratory technicians two health workers from psm department & one female health worker, one malaria worker, AWW ,by inquiring history of fever in last 15 days , if yes then thin & thick smear was collected by lab technician and smear was prepared by Giemsa stain by another lab technician & results were informed within 24 hrs and antimalarial as well as primaquine was given to each of them. This activity was further extended by doing knowledge, attitude, practice study of slide positive patient on 15/12/19 by two social workers, one laboratory technician and one associate professor through structured questionnaire.

III. RESULTS:

Table 1 Demographic profile of study subjects

Age (yrs)	Male	Female	Total (%)	Sex ratio
0-5	202	199	401(10.67)	985
5-15	413	477	890(23.68)	1154
15-45	967	865	1832(48.76)	894.5
45-60	258	237	495(13.17)	918
>60	62	77	139(3.69)	124
total	1902	1855	3757	975

Table 2 Age wise distribution of affected population

Age (yrs)	Fever cases	Slide positive	Proportion of affected (n=3757)
0-5	3	0	0
5-15	33	16	1.79
15-45	64	29	3.25
45-60	21	8	1.6
>60	13	4	2.8

Fever rate =3.48%
Monthly blood examination rate = 3.48%
Slide postivity rate = 43.5%
Slide falciparum rate =13/57=22.8%

Table 3: Descriptive characteristics related to KAP

Characteristics (no of cases) of per families	No of families (N=31)
1	24
2	3
3	3
4	2
Educational status	No. (N=47)
Illiterate	24(51.06)
Up to primary	14(29.97)
Up to SSC	6(12.76)
Up to HSC & above	3(6.38)
Symptoms of malaria narrated	No(47)
Fever only	8
Fever with chills	37
Headache	22
Body ache	13
Vomiting	19
Abdominal pain	5
Cough	2

Feeling not well	4
Convulsion	2
Giddiness	1
Treatment taken from	No. (%) N=47
Government	25 (53.19)
Private	18 (38.29)
Chemist	4(8.5)
Hospitalization	No. (n=47)
Yes	8 (17.02)
No	39 (82.97)
Anti mosquito measures adopted	No. (n=47)
Yes	21
No	26
Reason for not using anti mosquito measures	No. (26)
Economical	15
Do not know	8
Do not care	2
No h/o of mosquito bite	1

IV. RESULTS

- Demographic characteristic of target population includes 10.67% underfives.
- Sex ratio of under fives was 985/1000 males.
- Proportion of school going children (5-15) was 23.68 %
- Geriatric proportion was 3.69%

Malariometric indices

- fever rate was 3.48% ,
- monthly blood examination rate 3.48%
- slide positivity was 43.5%and slide falciparum rate was 22.8%

Descriptive characteristics of slide positives

- Only 82% of study subjects were covered under study
- More than half were illiterate.
- Almost one third of them were educated up to primary.
- Two third of them were unemployed followed by 19.14% were labour and 10.63 were driver /peon.
- Almost one third of them were living in kaccha house
- And in same proportion store water was found uncovered.
- Except one all had experienced history of mosquito bite
- In 83.87% studied premises adult mosquito was observed.
- Except in two premises all had potential breeding sites out side the premises.
- Anti mosquito measures were adopted by less than half of them.
- On enquiring about anti-vector mosquito measures most common measure found was smoke of Neem leaves followed by mosquito net, mosquito coil, insecticide vapors & residual sprays mosquito repellant.
- Most common reason for not using anti mosquito measure was economic as well as their casual attitude followed by lack of knowledge.
- Except one all had taken treatment.
- Government facility is utilized by almost half of them. 38.53% went to private practioners and 8.5% visited chemists for their illness.17.02% were hospitalized out of these 8 patients, 7 were hospitalized for 3 days and one for 5 days , for reasons such as malaria , convulsions, falciparum malaria and malaria with coinfection.
- Most common symptom narrated by them was fever, 78.72 followed by headache, vomiting and bodyache.

V. DISCUSSION

There was not even a single case among under fives ,constituting 10.67% of the total population, the school going children (5-15yrs) comprising nearly 23.68% of the total population contributed to 1.79% of the disease , people of 15-45 age group comprising 48.76 % of total population were found to be more vulnerable to

this disease (3.25%) . while Das R et al reported the school going children as the most affected population as comprising nearly 27% of the population contributed to 37% of all malaria cases but he observed the preschool children comprising only 13.6% of study population in his study to be more vulnerable to this disease contributing about one fifth of all malaria cases. [3]

the diagnosis of malaria parasite depends basically on the detection of parasite in the blood smear, the time tested economical and easily available method of detection is taking blood smear .slide positivity rate of peripheral blood smear examined ranged from 14.8% to 46.5%, shown by Das R et al in rural western U.P. in 2004, which seems to be similar to present study. [3]

The corresponding figure of national antimalarial programme stood much lower at 2.6% to 11.5% [(4)], SPR of 34.8% has been reported in passive surveillance for 1996-98 in the port city of Mangalore [(5)], which is in low congruity of our finding.

Lal et al has also reported a SPR of 12.8% in their study in Lakhan majra block of Rohtak in 1995, which again is much lower than present study. [(6)]

Despite huge presence of public health sector in developing countries, the lower socioeconomic class often uses the private clinics, at a fairly high cost as reflected from present study 38.29% patients visited private doctors for their illness. [(16)]

Although well planned vector control can contribute significantly in the reduction of this burden, the preventive power of vector control is grossly underutilized in public health. Insecticide treated bed nets and indoor spraying of houses with insecticide treated bed nets and residual insecticides are highly effective in preventing malaria transmission and thus reducing malaria morbidity and mortality[(17)] , This could be because of long commutation and waiting time at health outlets decrease their utilization. [(8)]

VI. CONCLUSION

Vector control clearly has an important role to play in the intensified control of tropical diseases. Factors that have contributed to this neglect include technical complexity, cost, and logistic needs, complacency, lack of timely actions, improper monitoring and environmental concerns. Therefore investments in vector control would need to be significantly increased. Moreover, the strategies being followed presently for malaria control seem to be grossly inadequate & need a thorough revamp, it is recommended that further multicentic studies be undertaken by independent agencies for qualification & stratification of malaria throughout the country. [(13)].

VII. RECOMMENDATIONS

The uptake of vector control as preventive strategy lags far behind the deployment of curative drugs, with the emergence of resistance to the first line of drugs, greater priorities needs to be given to preventive strategies based on vector control. [(13)]

- Prevention & control of out break
- Initiate vector surveillance and control measure
- Conduct IEC activities
- Motivate for community participation
- improve facilities for case management
- Alert health personal for reporting of cases.
- Early diagnosis & treatment to reduce parasitic load , hence spread & prevent death.
- Ensure compliance with complete treatment
- Give radical treatrment
- Prevent Mosquito bite
- Wear full sleeved clothes and long dresses/trousers
- Use insect repellent while sleeping at night & electric vapors, mates at day.
- Take additional care for children & elderly.
- Use mosquito nets for babies, old people and others, effectiveness can be improved by treating them with pyrethroid insecticides.
- Curtain can also be treated with insecticides & hung at windows or doorways to repel or kill mosquito.
- Keep patient protected from mosquito bite in the acute phase.
- Keep the surroundings of dispensary & hospital mosquito free.

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