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AN EVALUATION OF SURVEILLANCE OF MALARIA AT PRIMARY HEALTH CARE LEVEL IN KENYA

E.S. Some, MBChB, MPH, Community Epidemiologist, Malaria Unit, Environmental Health Programme, Kenya Country Office, African Medical and Research Foundation, formerly District Medical Officer, Nandi District, D.K. Koech, MLT, Medical Laboratory Technologist in-charge, Kapsabet District Hospital, J.O. Ochogo, MLT, Medical Laboratory Technologist in-charge, Chemase Health Centre, F. Ocholla, and F. Mumbi, ECN, Community Nurse, Chemase Health Centre.

Requests for reprints to: Dr. E.S. Some, Head, Malaria Unit, Environmental Health Programme, African Medical and Research Foundation, P.O Box 30125, Nairobi, Kenya.

AN EVALUATION OF SURVEILLANCE OF MALARIA AT PRIMARY HEALTH CARE LEVEL IN KENYA

E.S. SOME, D.K. KOECH, J.O. OCHOGO, F. OCHOLLA and F. MUMBI

SUMMARY

As less than twenty five per cent of persons suffering from malaria seek formal treatment in most of sub-Saharan Africa, facility-based morbidity statistics are inadequate for monitoring malaria control programmes. This explorative study assessed whether a health centre equipped with a microscope and trained personnel could monitor malaria transmission within its catchment area. The study was conducted at Chemase Health Centre in Nandi District in Kenya, an area holoendemic for malaria with *Anopheles gambiae* as the main vector and *Plasmodium falciparum* as the commonest cause of malaria. From first August to 31 October 1991, first seven children under five years of age on each working day accompanied by their mothers to the maternal and child health clinic were studied. A general examination was performed by a Registered Clinical Officer (Medical Assistant) and thin and thick blood smears made, stained with Giemsa stain and examined for malaria parasites by a Medical Laboratory Technologist. Mothers were interviewed by enrolled community nurses on antimalarial measures they were using in their homes. Four hundred and fifty five children mostly under five years of age, consisting of 48.1% males and 51.9% females, were studied. Malaria parasites were present in 209 (45.9%) blood smears of the children. The percentage of blood smears positive for malaria parasites was high in children below 36 months of age. There was a tendency for low percentage of blood smears positive for malaria in children whose mothers reported using mosquito nets or insecticide sprays. The study did not interrupt the routine of the health centre. Periodic monitoring of new malaria illnesses and percentage of blood smears positive for malaria parasites in children aged 0 to 35 months should be introduced into health centre practice in Kenya. This catchment area approach could be used to monitor malaria control programmes as well as predicting malaria epidemics.

INTRODUCTION

Malaria surveillance during a control programme is crucial. Surveillance should be focused on high risk groups. These include children and pregnant mothers(1,2) and non-immune persons, including travellers to malarious areas(3,4). Such surveillance should use indicators which are valid and reliable within the community covered by the control programme. But which indicators are available for malaria surveillance at primary health care facilities, such as health centres?

Traditionally new malaria cases are used to indicate presence and level of transmission(5). However, only 8% to 25% of persons suffering from malaria use formal health services for treatment in sub-Saharan Africa(6). In Kenya most persons suffering from malaria undertake self-medication with drugs from shops before seeking treatment in formal health facilities (7). Thus facility-based morbidity statistics would not be useful in monitoring a malaria control programme. The indicators should reflect even the state of persons who never seek treatment in formal health facilities.

One approach is to carry out repeated community cross-sectional surveys. Other approaches include the use of school children or donated blood from a given community to estimate the rate of malaria parasitaemia. These approaches are not cheap and may not be sustainable.

Children and mothers, however, have several characteristics that make them suitable target group to be used in monitoring a malaria control programme. First, both groups are generally at high risk for malaria. Second, both attend clinics regularly: infant and children for immunisation and growth monitoring; mothers for antenatal and postnatal care as well as fertility clinics. Third, maternal and child health (MCH) services have been set up mainly in primary health care level facilities. Fourth, influence of health education on malaria related behaviour would manifest in childrens' and mothers' utilisation of health services. Therefore a sample of children and mothers attending MCH clinics in peripheral health facilities could be examined for malaria parasites and other malariometric indicators. The number of new malaria cases and percentage of blood smear positivity for malaria parasites would be useful indicators for routine monitoring of malaria control

programmes. The purpose of this explorative study was to find out if a health centre equipped with a microscope and trained personnel could monitor malaria transmission within its catchment population using passive childhood parasitaemia levels.

MATERIALS AND METHODS

Study area: The study was conducted at Chemase Health Centre in the southern part of Nandi District below Nandi escarpment on the Kano plain but on the Rift Valley Province side. The rainy season is from March to June with a mean annual rainfall of 1,103 mm(8). Kalenjin and Luo ethnic groups live within the facility's catchment area. The area is holoendemic for malaria with spleen rates of over 75% in 2-9 year old children. The main malaria vectors are *Anopheles gambiae* and *Anopheles funestus. Plasmodium falciparum is* the commonest type of malaria(9).

At the time of the study, the health centre had no active malaria control programme within its catchment area. However, the health centre is a sentinel site for malaria surveillance of the Division of Vector Borne Diseases of the Ministry of Health. Staff at the centre monitor the rate of malaria parasites among out-patient attendance and occasionally among primary school pupils.

Study population: From first August to 31 October 1991 first seven children under five years of age on each working day accompanied by their mothers to the MCH clinic were studied. With consent obtained from the mother, a general examination was performed by the Registered Clinical Officer (Medical Assistant) on duty. Thin and thick blood smear were made from heel or finger bricks of children. Slides were processed and stained with Giemsa stain by a Medical Laboratory Technologist. One hundred high power fields were examined. Children found with malaria parasites were treated if they also had any medical complaints. Mothers of children were interviewed by Enrolled Community Nurses on antimalarial measures they were using to control malaria in their homes. None of the selected mothers refused to have their children studied.

RESULTS

Over a period of three months, 455 children mostly under five years of age, consisting of 48.1% males and 51.9% females, were studied. Malaria parasites were present in 209 (45.9%) blood smears of the children. The percentage of blood smears positive for malaria parasites by age was as shown in Table 1.

Table 1

Thick blood smears examined for malaria parasites by age of children attending MCH Clinic at Chemase Health Centre, Nandi district, 1991

Age (months)	No. examined	No. with malaria parasites	% positive for malaria parasites
0-11	139	72	51.8
12-23	112	57	50.9
24-35	67	37	55.2
36-47	41	16	39.0
48-59	43	14	32.6
60 +	53	13	24.5
Total	455	209	45.9

Note: The oldest child was 10 years.

Table 2

Thick blood smears examined for malaria parasites by reported antimalarial measure of mothers of children attending MCH Clinic at Chemase Health Centre, Nandi District, 1991

Reported antimalarial measure	No. examined	No. with malaria parasites	% positive for malaria parasites
Burn mosquito coils	81	42	51.8
No measure	238	114	47.9
Combinations excl. bednet	32	15	46.9
Combinations incl. bednet	39	18	46.2
Mosquito nets only	19	7	36.8
Insecticide sprays only	46	13	28.3
Total	455	209	45.9

The percentage was high from children below three years of age. There was a tendency for low percentage of blood smears positive for malaria parasites found among children whose mothers reported using mosquito nets or insecticide sprays (Table 2). The personnel observed that the study did not interrupt the routine of the health centre.

DISCUSSION

This explorative study has shown that periodic monitoring of new malaria illnesses and percentage of blood smears positive for malaria parasites in children aged 0 to 35 months should be introduced into health centre practice in Kenya. In addition to malaria morbidity data in mothers and children, childhood parasitaemia could be quantified and used to monitor malaria control programmes within catchment populations of primary health care facilities. The percentage of blood smears positive for malaria parasites among children aged O to 36 months would reflect malaria transmission even in those not seeking treatment in formal health facilities because children, especially under three years of age, rarely travel away from their communities.

The sampling used in this study was not satisfactory; it was used for convenience. Systematic or lot sampling could be used to make the sample of children representative. With repeated studies before and after a malaria control programme, adjusting for population increase, the trend in new malaria cases and percentage of positive blood smears in children would be more relevant monitoring malaria control programmes than the indicators absolute levels.

In Kenya, Rural Health Units (RHU), consisting of one Health Centre, one to two sub-health centres and two to three dispensaries, could be made to utilise the laboratory facilities at the health centres during a period selected to monitor malaria. Facilities and personnel needed are already in place. What is needed is to map out catchment populations for each RHU, trained medical laboratory technicians to quantified parasitemia levels, and train the health centre team to carry out malaria surveillance. This catchment area approach could be used to monitor malaria control programmes as well as predicting malaria epidemics.

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