

Research Article

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Confirmed malaria cases among under five children with fever and history of fever in Masogo sub-county, Kisumu county-Kenya

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Abstract

Background: The World Health Organization recommends that malaria treatment should begin with parasitological diagnosis. This will help to regulate misuse of anti-malarial drugs in areas with high transmission.

Aim: Aim was to assess the prevalence of parasitological confirmed malaria among under five years children presenting with fever or history of fever attending medication at Masogo sub-county hospital.

Setting: The study was conducted in Masogo Sub County, Kisumu County, Kenya.

Data and methodology: The study used 2020 dataset from the laboratory MOH 706 reporting tool with a total number of 6787 children under five years old tested in the lab.

Result: Of the 6787 test performed in the year 2020, 2225 (32.8%) turn positive to malaria parasite where there was high prevalence in female children at 1141 (51.3%) than male children 1084 (48.7%) of the total positive examined. Prevalence of the malaria among the age group bracket was high at 48-59 months old at 625 (28.1%) followed by 36-47 months 620 (27.9%), 24-35 months 450 (20.2%), 12-23 months 410 (18.4%) and lastly 0-11 months old at 120 (5.4%).

Conclusions: Reasons for the increased of the prevalence as the age increased among the under five children need to be further explored and addressed, there is enough evidence that immediate action is needed to address the unique needs of this population. Such factors could include lack of net used and separation of the mother and the child from sleeping together or early birth after the child.

Keywords: malaria; under five children; fever.

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Introduction

Malaria is an entrenched global health challenge and is a major public health concern in many countries including Kenya [1]. It is endemic in over 100 nations, and almost half of the global population is at risk of malaria, where about one million people die from malaria every year [2]. This deadly disease is transmitted in humans from one person to another indirectly via the bite of female mosquitoes of the genus *Anopheles*, which harbours one of five species of parasites belonging to the genus *Plasmodium* [2,3]. Worldwide, approximately 306,000 children under the age of 5 years died due to malaria, and approximately two thirds of these deaths occurred in the African region [4]. According to the World Health Organization (WHO), it is estimated that 9 out of 10 deaths in children were caused by malaria in Africa [2]. Transmission of malaria highly depends on the temperature, humidity, and rainfall [5]. High temperature and heavy rainfall in summer season leads the highest malaria transmission, especially in Africa [6]. Despite those climatic factors, malaria transmission is also determined by the socioeconomic conditions and knowledge of and access to malaria prevention tools as well as the healthcare services [6]

In Kenya, malaria alteration is relatively higher among the rural set than urban areas due to higher vector density, lower housing quality and poor drainage systems in rural settings [7]. Malaria is the main danger to public health and is the chief cause of morbidity and mortality in Kenya [8]. Out of 34 million Kenyans, around 25 million are estimated to be at danger of malaria, which is more than 70% of the population at danger [6]. Likely 6.7 million new clinical cases each year, with 4000 deaths happening mainly among children, make malaria a major health burden for Kenya [9]. Therefore, the intention of this study was to confirmed malaria cases among under five children with fever and history of fever attending medication in Masogo sub-county, Kisumu county-Kenya.

Materials and methods

This study used cross-sectional survey data from a secondary source extracted from the 2020 dataset from the laboratory MOH 706 reporting tool. The survey was based on the total under five children who were examined for malaria in the laboratory for the period of January to December 2020 which total to 6787 under five children.

Study site

The study was conducted at Masogo Sub-County Hospital (0.15660 S, 35.19840 E) in Kisumu County (East to Chemelil Sugar Company). Masogo Sub-County Hospital is a Government a 20 bed capacity health facility located in Masogo centre, Muhoroni Sub County in Kisumu County

Source and study population

All 6,787 under five children of age who were examine in the laboratory for the period of January to December 2020 were the source of the population of this study.

Sample size

The sample size was the total under five children who were examine for malaria in the laboratory department for the period of January to December 2020 which was 6787.

Data analysis

Statistical analysis was performed using Stata software. Data on prevalence were summarized by frequencies and percentages.

Ethical considerations

Confidentiality and privacy were strictly adhered to and no names of individuals were recorded or made known in the collection or reporting of information. The study was granted ethical clearance by hospital administration and from the sub county MOH office.

Result

There was high prevalence of confirmed malaria positive case in the month of February with 346 (5.1%) followed by January with 245 (3.6), March with 241 (3.5%), May with 232 (3.4%), July 206 (3.0%), April with 187 (2.8%), November with 164 (2.4%), September with 137 (2.0%), June with 162 (2.3%), August with 144 (2.1%), October with 123 (1.8%), and lastly December with 41 (0.6%) malaria positive. It also shows higher prevalence between the first quarter of the month of the year with a prevalence of 1019 (45.7%), followed by the Second quarter at 744 (33.4%) and lastly the third quarter of the year at 465 (20.9%) as in **Table 1**.

Table 1: Monthly confirmed malaria cases among under five children with fever and history of fever in Masogo sub-county hospital 2020.

Months	Quarters	Variable	Frequency (N=6787)	Percentage (%)	
January	1 st Quarter	Total Test done	798	11.8	
		Total positive	245	3.6	
February		Total Test done	1191	17.5	
		Total positive	346	5.1	
March		Total Test done	784	11.6	
		Total positive	241	3.5	
April		Total Test done	446	6.6	
		Total positive	187	2.8	
May		2 nd Quarter	Total Test done	745	11.0
			Total positive	232	3.4
June			Total Test done	411	6.1
			Total positive	162	2.3
July	Total Test done		599	8.8	
	Total positive		206	3.0	
August	Total Test done		406	6.0	
	Total positive		144	2.1	
September	3 rd Quarter		Total Test done	433	6.3
			Total positive	137	2.0
October			Total Test done	337	5.0
			Total positive	123	1.8
November		Total Test done	543	8.0	
		Total positive	164	2.4	
December		Total Test done	94	1.4	
		Total positive	41	0.6	

On gender prevalence was found to be higher in female gender children with 1141 (16.8%) than male children with 1084 (16.0%) as show in Table 2.

Table 2: Prevalence of confirmed malaria positive cases among gender group of under five children with fever and history of fever in Masogo sub-county hospital 2020.

Months	Gender	Frequency (N=2225)	Percentage (%)
January	Male	145	6.5
	Female	100	4.5
February	Male	106	4.8
	Female	240	10.8
March	Male	140	6.3
	Female	101	4.5
April	Male	80	3.6
	Female	107	4.8
May	Male	122	5.5
	Female	110	4.9
June	Male	62	2.8
	Female	100	4.5
July	Male	110	4.9
	Female	96	4.3
August	Male	74	3.3
	Female	70	3.1
September	Male	74	3.3
	Female	60	2.6
October	Male	56	2.5
	Female	67	3.0
November	Male	104	4.7
	Female	60	2.7
December	Male	11	0.5
	Female	30	1.3

Prevalence of the malaria among the age group bracket was high at 48-59 months old at 625 (28.1%) followed by 36-47 months 620 (27.9%), 24-35 months 450 (20.2%), 12-23 months 410 (18.4%) and lastly 0-11 months old at 120 (5.4%) as in table 3.

Table 3: Prevalence of malaria parasite among the age groups of under five children with fever and history of fever in Masogo sub-county hospital 2020.

Variables	Frequency (n=2225)	Percentage (%)
0-11 Months	120	5.4
12-23 Months	410	18.4
24-35 Months	450	20.2
36-47 Months	620	27.9
48-59 Months	625	28.1

Discussion

This study identified the prevalence and confirmed malaria cases among under five children with fever and history of fever in Masogo sub-county based on the hospital representative secondary data from the laboratory monthly reporting tool (MOH 706). The Kisumu county government tries to improve health service delivery with a high priority for malaria prevention and control among under five children [10]. The county government has established numerous effective strategies for monitoring

and evaluating malaria control on a regular basis, mainly focused on the reduction of malaria morbidity and mortality by 2030 [11].

This research exposed that malaria prevalence was higher between the first quarter of month of the year with a prevalence of 1019 (45.7%), followed by the Second quarter at 744 (33.4%) and lastly the third quarter of the year at 465 (20.9%) as in Table 1. This was due to the rainfall interval within the county which is usually high at the first quarter followed by the second and lastly the third quarter of the year. This finding consistent with the finding of another study in Africa, where malaria prevalence was found to be higher at the first quarter of the year than others among children aged 5–18 years [12].

Female children 1141 (16.8%) were found to have a higher prevalence than male children 1084 (16.0%) as show in Table 2. This finding did not conquer to several studies which reported that prevalence of malaria was higher in male than female children, which may be due to female children being less biologically vulnerable to infectious diseases than male children [1,10].

Similar to other studies, this study also revealed high prevalence of malaria at age group of 48-59 months at 625 (28.1%), followed by 36-47 months at 620 (27.9%), 24-35 months at 450 (20.2%), 12-23 months at 410 (18.4%) and lastly 0-11 months at 120 (5.4%) as shown in Table 3. This increase of the prevalence could be due to factors such as lack of net used, separation of the mother and the child from sleeping together and early birth after the child hence making them to be exposed to mosquito bites [13].

Conclusions

Findings of this study revealed that malaria still remains a public health problem, especially for children under 5 years in Kisumu County. It also confirmed some significant risk factors with independent effects on the prevalence of malaria among children under five as the year increase. This study also found a gap in translating knowledge into practice to prevent the potential infections. However, improvements in these factors with proper practice of preventive measures might have a positive effect in reducing malarial infection.

Recommendations

Based on the findings in this study, multi-modal programs are needed to control malaria in Kisumu County. Furthermore, need based innovative interventions and introducing Behaviour Change Communication program (BCC) to prevent and treat malaria are recommended to reduce the health burden caused by malaria. Education and awareness programs are suggested to use existing knowledge in practice to control malaria. Communications should be employed by a combination of radio and television programs, posters at local health facilities or identified public places, the formulation of groups of local stakeholders, and interventions such as the distribution and use of insecticide treated mosquito nets, especially for households.

Authors contributions: S. O. Awuor was the principal investigator and was the scientist involved in study methodology and design.

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Competing interests: The author declare that he has no competing interests

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Availability of data and materials: The datasets of 2020 of malaria report examine in the hospital are available in the laboratory reporting tool (MOH 706) and the County Demographic and Health Survey website.

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