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The Incidence of Plasmodium Falciparum and Salmonella Typhii as Co-Infection among Residents of Idiroko, Ipokia Local Government Area of Ogun State, Nigeria

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Abstract: ***This study assessed the incidence of malaria and typhoid infection among adult residents in Idiroko taking from October 2020-October 2021. The study used retrospective analyses of relevant information indicating malaria and typhoid infections among adult residents in Idiroko at the health information department of the state hospital, Idiroko, Ogun State. The data were analyzed statistically and the empirical values were represented. One thousand and eight hundred and ten cases of incidence of malaria, typhoid and their co-infection were extracted for the study, 601(33.2%) cases indicated for malaria only, 433(23.9%) cases for typhoid only and 776 (42.9%) cases had an incidence of malaria and typhoid as co-infections. There is no significant association between increasing age and positivity to the malaria parasite in this study. Female respondents 341(18.8%) were more infected with malaria parasite than the males 260(14.4%) as elucidated by the study. Although the difference observed was not statistically significant. A high prevalence (24%) of Salmonella typhi infections was recorded and the study showed an infection rate was higher in females 322(17.6%) than males 111(6.1%). In comparison, malaria and typhoid as co-infection were higher in females 539(29.8%) than males 237(13.1%). In conclusion, the incidence of malaria and typhoid infection and, co-infection among the adult residents in the Idiroko area of Ogun State is significantly high. To reduce the incidence of typhoid fever and malaria as co-infection, it is necessary to discourage people from taking junk food, maintain adequate personal, and environmental sanitation and prevent mosquito bites through the use of the medicated net.***

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Keywords: Malaria, Plasmodium falciparum, Salmonella typhii, and Typhoid.

1. INTRODUCTION

Malaria has five causative organisms- Plasmodium parasites and is transmitted by female Anopheles mosquitoes [1]. The dominant vector species are Anopheles gambiae and the Anopheles funestus group with some other groups playing a minor role [2]. It's a major public health issue in tropical areas, and it is evaluated to have been responsible for over 1 million deaths and about 500 million infections yearly [3]. In Nigeria, Plasmodium falciparum is the most common malaria parasite (>95.0 %), and P. ovale and P. malariae are responsible for other infections.

Salmonella typhi and paratyphoid are gastrointestinal tract infections where that establish pathogenicity and cause invasive disease with symptoms that vary from mild to more severe when exposed to such infection from six to thirty days.[4] Weakness and gastrointestinal disorders with headaches are notable symptoms exhibited by patients. Skin rash with coloured spots is seen in some people when untreated symptoms persist for weeks or months. Some infected persons are living with organisms without any sign of the symptoms and they are liable to spread the bacilli [5].

Typhoid and malaria fever are the two leading febrile illnesses of humans, in Africa. They are regarded as being diseases of major public health concern and the leading cause of morbidity and mortality. Malaria and typhoid fever as co-infection was first described in 1862 in North America as an entity called typho-malaria fever [6]. These diseases usually manifest in many nations where sanitation is poor, poverty ravished and less educated. Hence, this study was to evaluate the incidence of malaria and typhoid infections as co-infection among adult residents in Idiroko, Ogun State taking from October 2020- October 2021.

2. METHODS

A. Research Design

The research was retrospective design which employed the use of retrospective study (past records) in obtaining relevant information on incidence of malaria and typhoid infections among adults residing in Idiroko from October 2020- October 2021.

B. Study Location

The study location is Idiroko in Ipokia local government area of Ogun State, Nigeria. It is situated along the Nigeria-Benin border and has been an official border crossing point since at least the 1960s. The town is surrounded by many other towns and villages including Oke Odan, Ilase, Ita Egbe. Ajilete amongst others. Weather: 28°C, Wind SW at 14 km/h, 85% Humidity

C. Procedure for Data Collection

Data for this research work was obtained through the use of past records from the health information department of the State Hospital, Idiroko, Ogun State.

Data from October 2020- October 2021 were obtained on malaria and typhoid infection among adults population resident in Idiroko, Ogun State.

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3. RESULTS AND DISCUSSION

Data were obtained from the health information department as documented cases of malaria and typhoid infections among adult residents in Idiroko which span from October 2020-October 2021, the data were analyzed statistically and the empirical values were represented. Out of 1,810 cases of incidence of malaria, typhoid and their co-infection obtained from this study, 601(33.2%) cases had an incidence of malaria, 433(23.9%) cases had typhoid, and 776 (42.9%) cases had an incidence of malaria and typhoid as co-infections.

Table 1: Age Group Distribution of the sampled population at the State Hospital, Idiroko, Ogun State

Class interval (Year)	Frequency Examined	Percentage (%)	Valid percentage (%)	Cumulative percentage (%)
20-29	393	21.7	21.7	21.7
30-39	488	26.9	26.9	48.6
40-49	449	24.8	24.8	73.4
50-59	309	17.1	17.1	90.5
60-69	171	9.5	9.5	100
Total	1810	100	100	

Table 2: Sex Distribution of the sampled population at the State Hospital, Idiroko, Ogun State

Sex	Frequency	Percentage (%)	Valid percentage (%)	Cumulative percentage (%)
Male	608	33.6	33.6	33.6
Female	1202	66.4	66.4	100.0
Total	1810	100.0	100.0	

Table 3: Incidence of malaria, typhoid and co-infection in relationship to months under study

Months	Total number examined (%)	Malaria	Typhoid	Malaria & Typhoid (co-infection)
October(2020)	127	45(2.5%)	21(1.2%)	61(3.4%)
November (2020)	136	71(3.9%)	27(1.5%)	38(2.1%)
December (2020)	78	69(3.8%)	-	09(0.5%)
January (2021)	112	20(1.1%)	21(1.2%)	71(3.9%)
February (2021)	132	49(2.7%)	53(2.9%)	30(1.7%)
March (2021)	137	36(2.0%)	20(1.1%)	81 (4.5%)
Aprl (2021)	102	21(1.2%)	12(0.7%)	69 (3.8%)
May (2021)	207	50(2.8%)	39(2.2%)	118(6.5%)
June (2021)	244	73(4%)	101(5.6%)	70(3.9%)
July (2021)	137	49(3.8%)	43(3.5%)	45(4.4%)
August (2021)	124	40(2.2%)	50(2.8%)	34(1.9%)
September (2021)	152	42(2.3%)	19(1.0)	91(5.0%)

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October (2021)	122	36(2.0)	27(1.5%)	59(3.3%)
Total	**1810**	**601(33%)**	**433 (24%)**	**776(43%)**

This study reported a very high prevalence of malaria / typhoid as co-infections among adults residing in Idiroko from October 2020- October 2021. Recent malaria risk maps estimated that malaria prevalence in Nigeria varied from less than 20 % in certain areas to over 70 % in others [7]. The climatic conditions, less rainfall, and surface water that serve as mosquito breeding sites could have resulted in a different patterns of incidence. The 33.2% prevalent rate found in this study was lower compared to previous studies from Kano State (62.5%) (250/400) of the patients attending two hospitals in Kano Metropolis. A similarly high prevalence (61.3 %) was reported recently among patients attending Aminu Kano Teaching Hospital [8]. Previous studies among children in Kebbi, Awka, and the Abuja States reported prevalence rates of 64.0 % (128/200), 59.6 % (118/198), and 58.0 % (233/400), respectively [9], [10], [11]. There is no significant association between increasing age and positivity to the malaria parasite in this study. In this study, female respondents (18.8%) were more infected with malaria parasites than males (14.4%). The differences observed were not statistically significant. This finding was similar to [12] where higher parasitaemia was found in females than males. The prevalence of Salmonella typhi (24%) infections was recorded in this study. The prevalence of typhoid fever in this present study was lower compared to some of the previous studies by [13] who reported that 26% of the 300 students of selected tertiary institutions in Sokoto Nigeria, [14] who reported 28% of the 200 respondents in Barabanki University. India, [15], reported that 21.2% of the 250 participants in Abakaliki, Ebonyi State University, [16]) who reported 22.6% of the 589 students in Guntur, but however in contrast with the work of [17] who reported 10.1% of the 218 patients in Ahmadu Bello University Zaria, Kaduna State.
The study reported that 43% of the recorded patients had co-infection of malaria and typhoid which was high to singular infection (malaria 33% and typhoid 24%).

4. CONCLUSION

Based on this finding, the incidence of malaria and typhoid infections as co-infection among adults residing in the Idiroko area of Ogun State is significantly high.

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