The Prevalence Of Malaria In Yangoji And Gwagwalada Communities Of The Fct, Abuja.

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Abstract: A survey of the prevalence of malariaamong subjects presented with fibril illness in Yangoji and Gwagwalada areas of the Federal Capital Territory, was conducted from June 2015 to January 2016 at the University of Abuja Teaching Hospital in Gwagwalada and the Primary Health Care Centre in Yangoji, Kwali Area Council. A total of 500 individuals resident in Gwagwalada and Yangoji were examined for the presence of malaria parasiteamia microscopically. In Yangoji a rural community, of the 250 individuals sampled, the result showed a prevalence rate of 54.40% while the 250 number of individuals examined in Gwagwalada an urban settlement a prevalence rate of 47.20% was established. There was no significant difference in the prevalence of malaria between Yangoji and Gwagwalada (P-value > 0.05). There tends to be higher prevalence of malaria parasiteamia among males in both rural and urban areas 61.90% and 52.21% than females 48.96% and 43.07% respectively. Parasite intensity ranges from 102.00µl to 1590.90µl. *Plasmodium falciparum* was found to be the most prevalent species 87.78% and 89.87%, followed by *P. vivax* 6.49% and 5.26, while mixed infection was 5.73% and 4.86% respectively in the urban and rural areas. No observation of *P.malariea* and *p. ovale. w*as encountered.
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1. Introduction

Malaria due to *Plasmodium falciparum* remains one of the most important causes of morbidity and early mortality in endemic region of sub-Saharan Africa (WHO, 2013). An estimated 3.3 billion people are at risk of malaria of whom 1.2 billion are at high risk areas, more than one malaria cases occurs per 1000 population (WHO, 2014). The fact sheet on the world malaria report reveals that there were an estimated 198 million cases of malaria worldwide (range 124-283 million) in 2013, and an estimated 584,000 death (range 367,000 - 755,000). 90% of all malaria deaths occurs in Africa (WHO, 2014).

Nigeria has the largest population at risk of malaria in Africa with stable transmission throughout the country. In Nigeria, Malaria is among the top three causes of death in the country (National Malaria Control Plan of Action 1996-2001) culminating into a social and economic problems, current malaria control strategies involve early diagnoses and treatment of infected individuals and the reduction of human-mosquito contact rate through vector control efforts (Mushinzimana *et al.,* 2006) malaria related mortality, morbidity and economic loss could therefore be averted if the available effective preventive and treatment interventions are made accessible to those in need (Breman *et al.,* 2007). Nevertheless, inadequate access to information healthcare and anti-malaria resources results in the inability to properly implement malaria intervention (Welch, 2012).

Furthermore, disparities in access between rural areas found to have less access to malaria control interventions (Barat *et al.,* 2004)Insecticide treated nets (ITNs) and indoor residual spraying have been demonstrated to reduce malaria (Draper *et al.,* 1960) and to date are the mainstay for controlling malaria vectors and associated malaria transmission (Kazembe *et al.,* 2007). Some prophylactic and treatment measure have proved ineffective especially with the incidence of malaria resistance to most anti-malaria drugs (WHO, 2000) preventing vector-host contact has been identified as the most effective measures in halting this trend (Lengeler, 2004).

This investigation covers the urban area of Gwagwalada Area Council and Yangoji a rural area in kwali Area Council of the FCT, focusing on the prevalence of malaria in both sexes. It's imperative therefore to evaluate the prevalence of malaria in the FCT in order to know the current status of malaria transmission.

2. Materialand Methods

The research was carried out in Gwagwalada town of Gwagwalada Area Council and Yangoji in Kwali Area council, which are members of the six Local Government Area Councils of the FCT. Gwagwalada and kwali lies between longitude 8^0 and 8^056^1 east and latitude 7^0 58^1 and 7^0 05^1 North. Gwagwalada is the name of the main town in the Local Government Area, it has a population of

157,700as at the 2006 census and has grown to over 1,000000, with an area of 1069.589km.

Kwali has an area of 1206km, with a population of 85,837 as at 2006 census and has grown to over 1,000000. Gwagwalada and Kwali share similar socio-cultural life which includes, farming, hunting and trading. (Awowole 2007).

The samples consist of 500 subjects of adult and children both male and female from Yangoji and Gwagwalada respectively.

Venous blood was collected into sample bottle containing potassium EDTA anticoagulant.

Using a 5ml syringe and needle the vein was punctured and about 4ml of blood drawn into a labeled EDTA anticoagulant bottle and mixed gently. Both thick and thin films are made from each patients sample immediately at the point of collection on same slide as described by Chesbrough (2005).

A small drop of blood (2µl) was placed at the center of a clean, grease free microscope slide, for thin film and a larger one (6µl) about 15mm to the right for thick film. Immediately the thin film was spread using a smooth edged glass spreader. Without delay the larger drop of blood was spread to make a thick smear covering an area of about 15mm. The films were allowed to air dry in a horizontal position on a flat surface. The thin film was fixed with absolute methanol for 2 minutes to ensure that the smear does not wash away and to fix the cells well and the thick film was heated fixed in a hot air oven at 40°C for 20 minutes.10% (1:10) dilution of the Giemsa stain was made in buffered water (pH 7.1-7.2) immediately before staining and the films are to be stained using the following procedure as stated by WHO (2010).

The slide was placed on a staining rack and flooded with 10% Geimsa stain and stained for 10minutes.

The slides was washed gently with clean water, the back wiped and air dry.

Counting of Parasite density in blood in a micro liter (µl) of blood was done using WHO method of counting parasite density in thick film (WHO, 2004). The number of parasites counted alongside the count of 8000 leukocytes (WBC) is equivalent to the number of parasites in one micro liter of blood.

All data obtained were analyzed using the student 't'-test and chi-square at 0.05 level of probability.

3. Results.

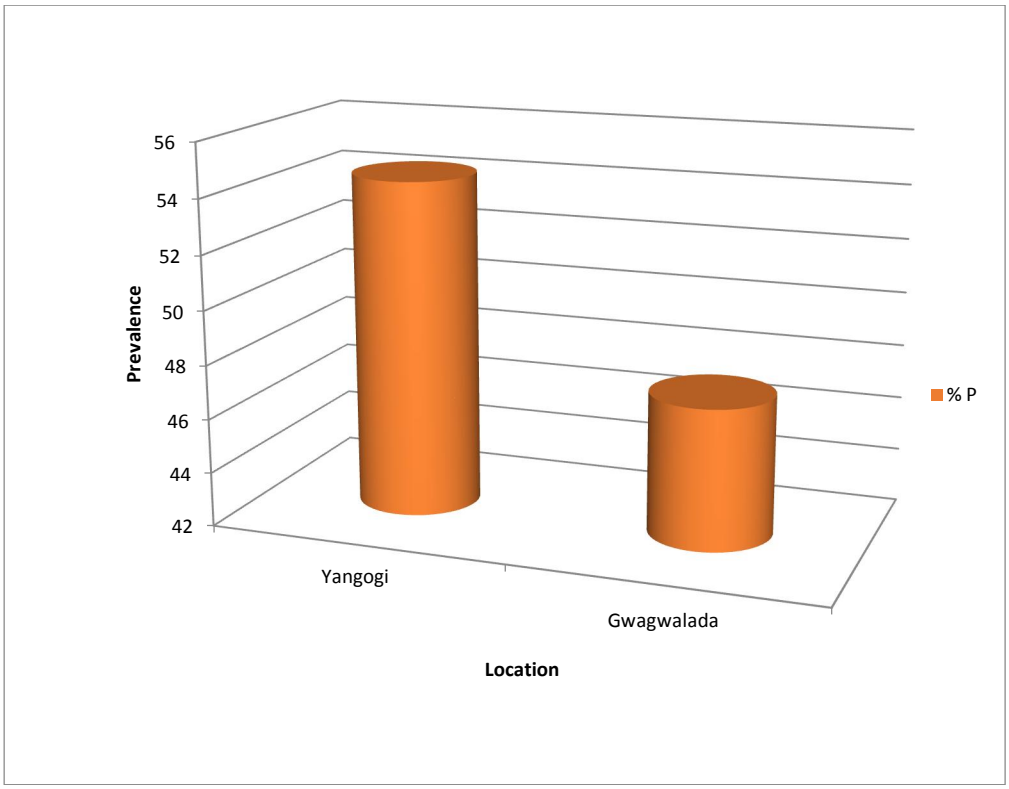

Figure 1. The overall prevalence of malaria in Yangogi and Gwagwalada.
P = overall prevalence

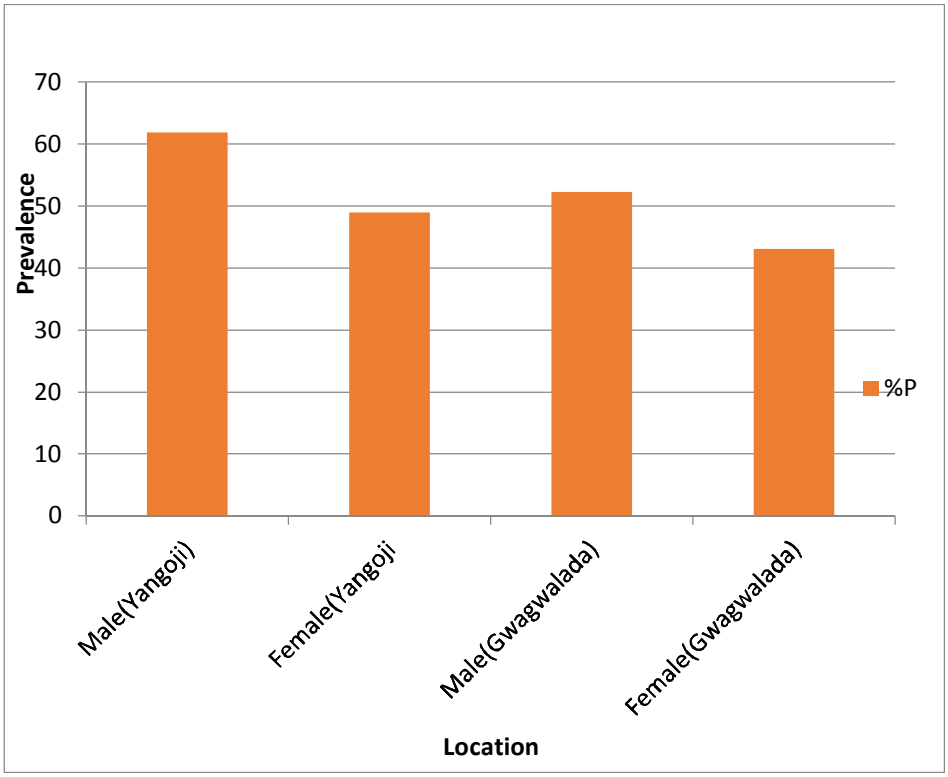

Figure 2. Prevalence of Malaria Based On Sex in Yangoji and Gwagwalada
P = overall prevalence

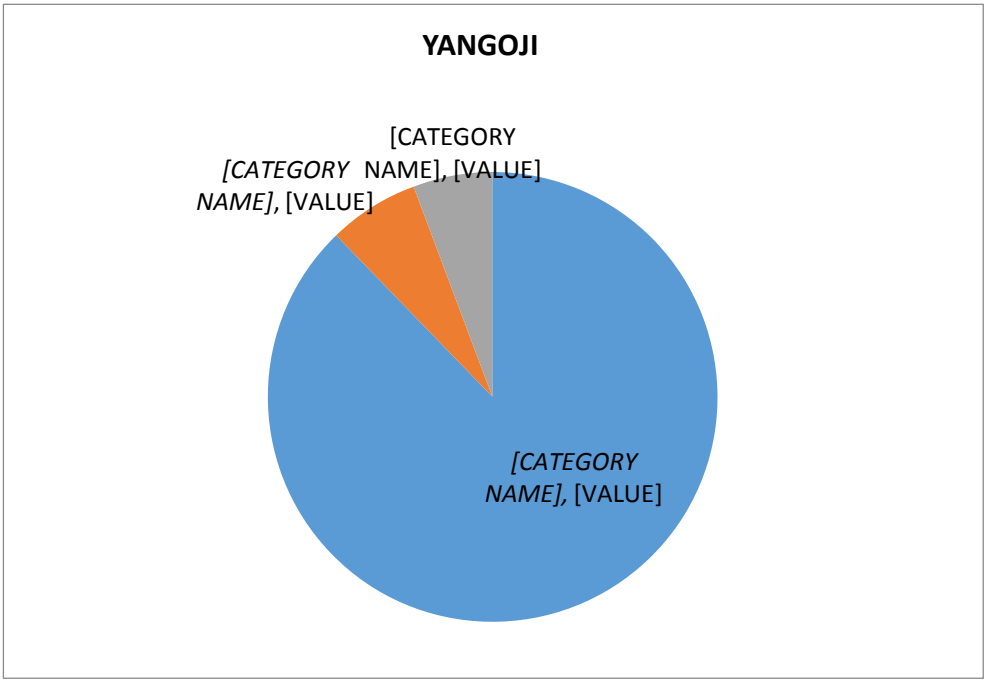

Figure 3. The Prevalence of *Plasmodium species*

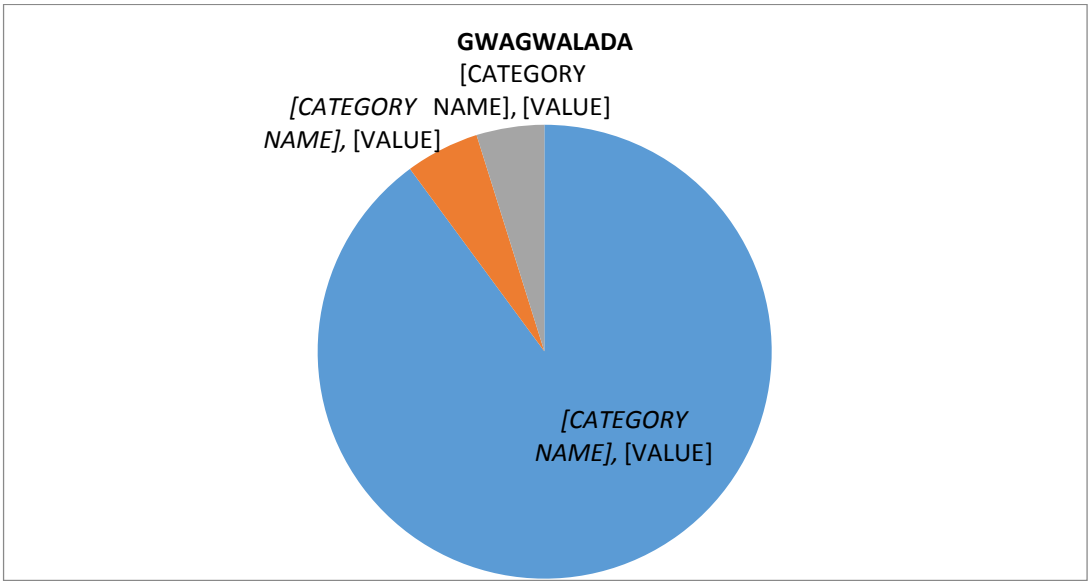

Figure 4. The Prevalence of *Plasmodium species*

Table 1. *Plasmodium* parasite intensity µl/blood

Study area	Age	Male (×±SEM)	Female (×±SEM)
	0-5	222.50±16.50	102.00±13.40
	6-11	545.80±40.60	355.80±30.80
Yangoji	12-16	699.6±34.40	670.50±40.80
	17-21	814.80±18.60	935.80±28.90
	≥22	1096.60±74.20	815.30±40.10
	0-5	161.70±19.20	203.33±4.34
	6-11	812.50±25.90	825.00±62.90
Gwagwalada	12-16	889.50±17.20	729.00±8.00
	17-21	978.30±27.50	889.90±28.50
	≥22	1590.09±39.10	1520.60±7.24

Figure 1 From the data obtained the overall prevalence of malaria, was 54.40% and 47.20% in Yangoji and Gwagwalada respectively.

Figure 2 explains the prevalence of malaria based on sex in Yangoji and Gwagwalada. Prevalence of malaria in males and females in Yangoji were 61.90% and 48.96%, and in Gwagwalada, 52.21%, and 43.07% respectively.

Figure 3 and 4 illustrates the prevalence of *Plasmodium* species in Yangoji and Gwagwalada, *Plasmodium falciparum* is 87.78% and 89.87% being the most prevalent, *Plasmodium vivax*, is 6.49% and 5.26% while mixed infection is 5.73% and 4.86% in Yangoji and Gwagwalada respectively**.**

Table 1 the mean parasitaemia intensity per microliter of blood in Yangoji and Gwagwalada is elucidated in Table 1. The lowest and highest parasiteamia intensity recorded was 102µl and 1096.60µl with a SEM of ±13.40 and ±74.20 in Yangoji respectively. While in Gwagwalada 161.70±19.20 and 1590.90±39.10 was recorded. Statistical analysis using Chi-Square at p-value < 0.05 shows that there was an association between the age and gender, based on the intensity of parasiteamia per microliter of blood in both Yangoji and Gwagwalada.

4. Discussion

The study on the prevalence of malaria in Yangoji and Gwagwalada communities was conducted from June 2014 to January 2016 in the Federal Capital Territory of Abuja, utilizing the centralized medical institutions in the various localities, the University of Abuja Teaching Hospital in Gwagwalada and the Primary Health Care Center in Yangoji Kwali Area Council, FCT, Abuja.

A total of 500 individuals resident in Gwagwalada town and Yangoji district were examined respectively for the presence of parasiteamia using microscopy as a gold standard for smear examination.

In Yangoji a rural community, 250 blood samples were microscopically examined and the result showed a prevalence rate of 54.40% while the number of individual examined in Gwagwalada an urban settlement was 250, with a prevalence rate of 47.20% comparatively less than that of Yangoji arural community, similar to the report of some researchers in some part of Nigeria, An overall prevalence rate of 67.00% was recorded among patients with febrile illness in General Hospital Gwarimpa, Abuja,(Nmadu 2015) 35.70% in Kaduna (Milicent et al., 2015), 36.10% and 36.60% respectively in Plateau and Abia states respectively, (Noland et al., 2014).

Similarly, Aina et al.(2013) had reported 14.70% prevalence rate in Ikorodu, Lagos State during the dry season. Elsewhere, Inam *et al.* (2013) reported a prevalence rate of 81.00% in a rural community and 18.16% in an urban community in Bannu district of Pakistan, Where he attributed the high prevalence rate in the rural area to the presence of swampy field, unsanitary environmental condition with stagnant ponds and gutters which favors the breeding of mosquitoes resulting to high mosquitoes population.

Comparatively, the prevalence of malaria in Yangoji and Gwagwalada can be related to some underlined factors such as similarity in environmental factors. Though Gwagwalada appears to be an urban area it shares certain environmental features with Yangoji viz are the presence of gutters containing stagnant water, hips of garbage piled along roadsides and in residential areas, these conditions provides an enabling habitat for the breeding of mosquitoes and subsequently, transmission of malaria (Inam *et al.,* 2013). Statistical analysis showed that there was no significant difference in the prevalence of malaria in Yangoji and Gwagwalada.

The overall prevalence of malaria among males and females in Yangoji were 61.90% and 48.96% and in Gwagwalada, 52.21%, and 43.07%, respectively this is in line with the reports of Nmadu (2015) who reported 67.45% and 61.23% among males and females in Gwaripa, Abuja. There was a significant difference ($p<0.05$) in the prevalence of malaria among males and females in Yangoji, but not significantly different in Gwagwalada ($p>0.05$).

Plasmodium falciparum recorded a prevalent rate of 87.78%, and 89.87% followed by *P vivax* 6.49%, and 5.26% while mixed infection was 5.73%, and 4.86% in both Yangoji and Gwagwalada respectively. Conversely, there was no observation of *P.malariea* and *P.ovale*, encounterd. Nmadu *et al* (2015) documented 62.5% prevalence rate *Plasmodium falciparum*, Noland *et al* (2014), and Aina *et al* (2013) reported a similar high rate of *Plasmodium falciparum.*

In conclusion, this study provides information on the current status of parasiteamia prevalence in these communities. Thus, anticipated efforts should be geared towards enforcing a proactive preventive and control measures in reducing malaria transmission.

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