

EPIDERMIOLOGY OF MALARIA PARASITE AMONG PREGNANT WOMEN BETWEEN THE AGES OF TWENTY AND FORTY NINE YEARS (20 - 49YEARS), ATTENDING THE PRE&ANTENATAL CARE OF KEGBARA DERE HEALTH CENTRE, IN GOKANA LOCAL GOVERNMENT AREA, RIVERS STATE.

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Abstract

This study is aimed to evaluate the prevalence of malaria parasite among pregnant women between the ages of 20 - 49years, attending the Prenatal and Antenatal care at Kegbara Dere Health Care Centre, in Gokana Local Government Area, Rivers State, Nigeria. A total of 100 samples of 100 randomly selected pregnant women were evaluated. Thick and thin films of whole blood were made and stained, using standard procedures. A total of seventy two percent (72.0%) of the 100 pregnant women being investigated tested positive for malaria parasite, with highest occurrence of 38.89% among women of 30-34years, whereas the least occurrence (1.39%) was observed among women of 20-24years. Results also indicated that pregnant women within the range of 25-29years and 45-49years were found at the infection prevalence rate of 6.94% and 5.56% respectively. Whereas, women whose age brackets were 40-44years had malaria parasite at infection rate of 19.44%. The results stand as a study guide for recommendation to Rivers State Government, people of Gokana LGA and others within and without my study site, in other to educate the general society about the prevalence of malaria, and need to secure pregnant women from infection by ensuring better management of our Prenatal and Antenatal facilities.

Introduction

The assessment of the prevalence of malaria parasite in Kegbara Dere Health Centre, in Gokana Local Government Area, Rivers State, Nigeria, among the pregnant women will help to bring positive remedies to the impacts of the Plasmodium disease in the area. Such study could provide

better means of diagnosis, treatment, control and prevention of malaria parasites in the affected area. Gokana is a region of Ogoni in Rivers State, Niger Delta, Nigeria South-South.

Nigeria is known for high prevalence of malaria and it is a leading cause of mortality and morbidity in the country including Gokana metropolis in Rivers State, Nigeria. Pregnant mothers and young children are especially vulnerable in endemic areas. Considering the above complication of malaria, it becomes ideal for the current study to assess the prevalence of malaria parasite infection among young children and pregnant women as to determine the rate of occurrence.

Malaria Parasite is an infection caused by a parasite of the genus *Plasmodium*. There are four identified species of this genus, causing malaria namely; *Plasmodium ovale*, *P. falciparum*, *P. vivax* and *Plasmodium malariae* (Mendis et al., 2001).

Malaria is most prevalent in the tropical and subtropical regions, and is a deadly disease that still kills more than a million people each year. Nigeria is known for high prevalence of malaria and it is a leading cause of morbidity and mortality in the country (WHO, 2005). Records have shown that at least 60% of the Nigeria population suffers from at least episode of malaria each year. Malaria is also a major cause of jaundice and anaemia in unborn babies and associated convulsion in young babies (Ikeh and Ngo-Ndomb, 2008). In Nigeria, 98% of all cases of malaria is due to *Plasmodium falciparum*. This is the species that is responsible for the severe form of this disease that leads to death (Genton, et al, 2008). Malaria is transmitted from bite of an infected female anopheles mosquito to man.

The current study aims at assessing the prevalence of malaria parasites in Kegbara Dere Health Centre, in Gokana Local Government Area, among the pregnant women ranging between the ages of 20-49 years. This study will also suggest useful control measures, diagnosis, treatment as well as creating public awareness of the epidemic within Gokana Local Government Area.

The current study is particularly focused on the assessment of the prevalence of malaria parasite in Kegbara Dere Health Centre, in Gokana Local Government Area, Rivers State, Nigeria, Among pregnant women attending prenatal and antenatal care of K-Dere Health facility. The study could extend to literally discuss on the epidemiology of the disease as to visit current means of diagnosis, treatment, control and general prevention of the parasite to save the entire public health in Gokana Local Government Area.

Diagnosis the process of determining the nature of symptom or disorder by considering the patient sign and symptom, medical background, and- when necessary- result of laboratory x-ray examinations.

Sign an indication of a particular disorder that is observed by a physician but is not apparent to the patient.

Symptom is an indication of a disease or disorder noticed by the patient himself. Malaria remain the most devastating infection of humankind, which claims more than 1 million lives each year [Guinovart, et. al., 2006; Snow et al., 2005]. Mendis, et. al., [2006], indicated in their study that the human disease is caused by infection with one of the four Plasmodium parasites, Plasmodium falciparum, Plasmodium vivax, Plasmodium ovale, and Plasmodium malariae.

Malaria parasites are transmitted by infected female anopheles mosquito which inject sporozoites present in the saliva of the insect, sporozoites infect the parenchymal cells where they may remain dormant or undergo stages of schizont and merogony to produce merozoites (Snow, et al., 2005). When parenchyma ruptured, thousands of merozoites are released into the blood and infect the red blood cells. Plasmodium infect both mature and immature red cells which ultimately burst and release daughter merozoites some of the megame to cells capable of producing sex cell while others enter the red cells to continue the erythrocytic cycle. The gametocytes are ingested by the female anopheles mosquito. The Oocyst produced sporozoites (sporogony) which migrate to the salivary gland and are ready to infect another host for the cycle to continue (Snow, et. al., 2005).

Malaria remains one of the world greatest childhood and pregnant women killers and is a substantial obstacle to social and economic development in the tropics (Olasehinde, et. al., 2010).

Nigeria is known for high prevalence of malaria and it is a leading cause of morbidity and mortality among vulnerable groups in which pregnant women and children of 0-12 months belong (Ojurongbe, et. al., 2007).

Plasmodium falciparum is the species that is responsible for the severe form of these disease that leads to death. In area of endemic malaria, Plasmodium falciparum infection during pregnancy increases the likelihood of maternal anaemia, abortion etc, anti- malaria drugs should be administered at least twice during pregnancy in order to reduce the incidence of low birth and anaemia (WHO, 2003).

The liver infection can be initiated by only a few spotozoites and this likely contributes to the success of malaria transmission (Weiss, 1990). The liver (Extra-erythrocytic circle) takes 5-15days, whereas the erythrocytic cycle takes 48-75hrs. (Berenzen, et. al., 2003; Hoffman, et. al., 2002), reported that the immune target appears to be the early liver stage of malaria parasites .Genton, et. al.(2008)summarized their study that 98% of all cases of malaria parasite in Nigeria is due to Plasmodium falciparum. This is the species that is responsible for the sereral form of this disease that lead to death. (Yeung, et. al., 2004), reported that drug resistance in Plasmodium falciparum is one of the major health problem in malaria endemic regions. Their work explained that understanding the molecular

mechanisms of drug resistance in malaria parasites may allow development of better drug treatment policies and strategies to overcome resistance. (Rieckman, et. al., 1978), have showed that various methods been developed to evaluate parasite response to antimalarial drugs.

All based on measuring parasite growth or growth inhibition under various drug concentrations, including counting of parasitemia. Finally, mixed infection of different genotype are highly prevalent in malaria endemic, particularly in Africa and southeast Asia (Anderso, et, al., 2000), According to (WHO 2005), malaria ranks first because of its morbidity, mortality problems of diagnosis, lack of ideal drugs and effective vaccine as well as other behaviours of the vector. WHO (2003) also estimated about 20% of children deaths and half fever episodes among African children under five years is endemic areas are as a result of malaria. WHO (2005), reported that pregnant women and unborn children are vulnerable to malaria, which is a major cause of perinatal mortality, low birth weight and maternal anaemia. Other work done by Ikeh, et al. (2008), showed that children under five year of age, pregnant women and immune-compromised individuals are at higher risk of severe malaria than those living in endemic areas.

Carol, et, al (2007), reported that Insecticides Treated Net (ITNs) offer a form of personal protection and have repeatedly been shown to reduce severe disease and mortality due to malaria for both children and pregnant women in endemic regions. According to (Federal Ministry of Health, 2005), malaria infected during pregnancy can have adverse effects on both mother and foetus; including maternal anaemia, jaundice, foetal loss, premature delivery, intrauterine growth retardation and delivery of low birth weight infant (<2.5kg or 5.5pounds) WHO (2005), indicated that there have been several effort at combating malaria which point towards early diagnosis and effective treatment of affected person but unfortunately, the control of malaria parasites are becoming increasingly resistant to anti malaria drugs, therefore control cannot be based on treatment only. Thus, the need to include preventive measures arose. In response to this problems the Head Government and International Agencies at the African summit on Roll Back Malaria (RBM) held at Abuja in year 2000 declared that malaria involves the use of Insecticide Treated Nets (ITNs) particularly in malaria endemic regions.

Subsequently, there had been free distribution of the ITNs donated by the Roll Back Malaria to children under five years and pregnant women.

Materials and Methods

Careful consult with Pregnant women between the ages of 20-49years attending the Prenatal and Antenatal clinic unit at the Kegbara Dere Health Centre, in Gokana Local Government Area, Rivers State was made to source for evidence and rate of occurrence of malaria parasite among them.

One hundred (100) pregnant women between the age brackets of 20-49years were randomly selected, and screened for malaria parasites by laboratory tests, without considering any previous of their clinical diagnosis. As a way to observe universal precautions, the pregnant women were duly informed before the various blood samples were collected. Their personal data which included age, sex and nativity in particular were recorded, to ensure identification.

Sample collection: veno-puncture

The arm of the pregnant women was examined for a prominent vein. Tourniquet was applied 3-4 inches above the selected puncture site. Using a sterile swab the arm was cleansed in a circular fashion, using 70% alcohol about the prominent vein or the puncture site and, then allowed to dry. Whole blood was withdrawn using a sterile 2ml syringe and needle for each patient. The needle was inserted swiftly and gently through the skin and into the vein, and about 0.5ml of blood was gently withdrawn. The whole blood samples collected were transferred into an EDTA bottle, agitated to mix, labelled and numbered for proper identification and transferred to the laboratory for proper diagnosis. Two drops of blood were placed separately on two clean grease free slides, thick and thin blood films were made for each patient and labelled accordingly.

Staining procedure for thick film:

Smear of the fresh whole blood was made upon clean glass slide, labelled and allow to dried completely by air and not exposing them to sunlight.

The slides having the thick films were placed on a staining rack and flooded with field stain A to cover each slide. It was allowed to stain for 1 minute, and then gently washed off with tap water; the slides were further counter stained with field stain B, and washed again with tap water. Then allowed to air dried.

One or two drops of oil immersion were added to the stained slides each and were finally viewed with the x100 objective power of a compound microscope.

Staining Procedure for thin film

The thin films were allowed to air dry, and then fixed in 100% methanol for 1-2 minutes. The methanol was rinsed off and the slides placed on a staining rack. They were then flooded with 3% Giemsa stain at pH 7.2 to cover each slide. It was allowed to stain for 30-45 minutes. It was then gently washed off with tap water with the slide lying horizontally. The

stained were placed in a drying rack to drain and dry. One or two drops of oil immersion were added to the stained slides each and were finally viewed with x100 objective power of microscope.

Microscopy

The stained blood films were examined microscopically, using x100 or oil immersion objective as described by Cheesebrough (2000). The thick films were used to determine the parasite densities while thin films were used to identify the parasite species and infective stages.

Result and Discussion

Table: Prevalence of malaria parasite in pregnant women between the age brackets of 20-49 years.

AGE	NE	NI	%PI
20-24	03	01	1.39
25-29	07	05	6.94
30-34	30	28	38.89
35-39	35	20	27.78
40-44	17	14	19.44
45-49	08	04	5.56
Total	100	72	100

KEY: NE.....Number examined.
 NI.....Number infected.
 %PI.....Infection rate and Prevalence

From the table, results showed that pregnant women within the age bracket of 30-34years have had the highest malaria infection, rated at 38.89%. Pregnant women of 35-39years investigated were found to have malaria infection at the rate of 27.78%, whereas those at the age group 20-24 years had least rate of malaria infection at a prevalence rate of 1.39%. Pregnant women within the age rang of 25-29years and 45-49years respectively were found within the infection prevalence rate of 6.94% and 5.56% respectively, whereas women whose age brackets were 40-44years had malaria parasite infection rate of 19.44%. The finding is however, compatible with some report where younger maternal ages of between 30-44 years were declared as having significant association with malaria parasitaemia.

The prevalence of malaria infection decreased relatively with increase in age (45-49years) of the pregnant women, this may be because of the highly educated ones would have been better informed about the prevention and control of malaria infection, and may have applied adequate measures against mosquito parasites. On the other hand, the semi-illiterates and illiterates are more exposed to malaria parasite due to their general life style, non-befitting environmental conditions which encourage the breeding

of mosquitoes as well as the low level of knowledge of the benefit of using insecticide treated nets (ITNs)(Diadier,et. al., 2007).

Out of the one hundred (100) pregnant women between the age bracket of 20-49years examined 72% were found to have malaria infection, only 28% were not infected, in which the age group of 30-34 years had the highest rate of occurrence at 38.89%. The least occurrence was found among pregnant women of age 20-24 years, rated at 1.39%.

Considering the important of pregnant women in our society, the education of the pregnant women on malaria infection, prevention and control through healthcare deliveries and environmental management will help to reduce malaria infection. Private and public bodies should also assist the government in donating and ensuring access to basic healthcare such as free anti-malaria drugs and long lasting insecticide treated nets (ITNs) which is the goal of malaria control programmes.

Recommendation

The study of the prevalence of malaria parasite among the pregnant women at Prenatal and Antenatal Care unit of Kegbara Dere Health Centre, in Gokana Local Government Area, Rivers State, is a worth very high recommendation to the people within and outside the studied area (Kegbara Dere Health Centre, in Gokana Local Government Area), especially among the study group of pregnant women, in other to educate our women and girls to ensure better care and management of malaria in their pregnancies. The study could serve as a reference point by the 'WHO' (World Health Organisation) on the current malaria status of the pregnant women within the studied area for purpose of research, and as recommendation to the World Health Organization for the prospective grass-root roll back malaria programmes within Gokana Local Government Area.

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