

Prevalence of Malaria among Pregnant Women in Nigeria: A Scoping Review of Literature

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Abstract

Background: Malaria in pregnancy remains a major contributor to maternal and infant morbidity and mortality despite scale up in interventions. Its prevention is one of the major interventions in reducing maternal and infant morbidity and mortality. It is known to cause higher rates of miscarriage, intrauterine death, premature delivery, low birth-weight babies, and neonatal deaths. Since pregnant women are most vulnerable to malaria, implementation of the appropriate prevention and control measures among this group is very important. Therefore, the current review was designed to assess the prevalence of malaria among pregnant women in Nigeria. **Method:** A systematic analysis of recent literature on the prevalence of malaria in pregnancy was carried out and the evidence synthesized. The databases used were Google Scholar, MEDLINE and PubMed. Search terms used were “prevalence”, “malaria”, “pregnant women”, and “Nigeria”. Studies included were cross sectional studies published in different journals on the prevalence of malaria among pregnant women. The total population from the various studies analyzed was two thousand, eight hundred and sixty-six pregnant women between 15 and 45 years. All the women reside in rural and semi-urban areas in Nigeria. **Findings:** Among the six studies included in this analysis, the estimated pooled prevalence of malaria among pregnant women in Nigeria was 22% in North-Central, 41% in South-East, 26% in South-South, 4.3% in South-West, 41.6% in North-West and 36.74% in North-East. **Conclusion:** The current review showed that the pooled prevalence of malaria among pregnant women was relatively higher when compared with the prevalence of malaria in the general population. Therefore, the existing prevention and control measures should be strengthened; interventions on malaria prevention and control should focus on behavior change communication.

Key Words: Malaria; Pregnancy; Prevalence; Interventions

1. Introduction

Malaria is a major public health issue in Nigeria, with about 97% of the population at risk of malaria. This is because malaria accounts for about 60% of outpatient visits and 30% of hospitalizations, as well as 25% of infant mortality; 30% of under-5 mortality and 11% of maternal deaths of which children and pregnant women are the major population at risk (NMEP, 2010). According to Iyanda et al., (2020) malaria preventive behaviours among pregnant women is generally poor across the six geo-political zones in Nigeria. Sadly, malaria is a leading cause of illness and death in Nigeria, however, access to quality anti-malarial services remains low especially in the rural areas where there are poor and vulnerable people. While there are other factors associated with the infection and spread of malaria, environmental factors such as the presence of bushes, stagnant water around homes, rainfall, low altitude and high temperatures are huge contributors to the breeding of malaria vectors and the parasite reproduction (WHO, 2015).

Furthermore, malaria is unique among diseases because its roots lie so deep within human communities (Holding & Kitsao-Wekulo, 2004). Beliefs and practices related to malaria are often associated with culture and can influence the effectiveness of control practices (Amuta et al. 2014). The understanding of the possible causes, modes of transmission,

and decision about adoption of preventive and control measures vary from community to community and among individual households (Kimbi et al. 2015). However, a lot of misconceptions concerning malaria still exist. Thus, local knowledge and practices related to malaria are important for the implementation of culturally appropriate, sustainable, and effective interventions (Vijayakumar, 2009). Moreover, the World Health Organization reported in 2020 that nearly half of the world's population was at risk of malaria infection. However, some population groups are at considerably higher risk of contracting malaria and developing severe complications this group includes- infants, children under 5 years pregnant women, patients with HIV/AIDS and people with low immunity moving to areas with intense malaria transmission.

Nonetheless, malaria in pregnancy remains a key contributor to maternal and infant morbidity and mortality despite scale up in interventions. Its prevention is one of the major interventions in reducing maternal and infant morbidity and mortality. It is known to cause higher rates of miscarriage, intrauterine death, premature delivery, low birth-weight babies, and neonatal deaths (Schantz-Dunn & Nour, 2009). As a result, various stakeholders including the World Health Organization (WHO) have called for a multifaceted approach including the use of antenatal care model (ANC) in the reduction and elimination of malaria in pregnancy. Interesting, Nigeria has adopted the 2016 WHO ANC model which recommends a minimum of eight contacts during pregnancy. According to the USAID Malaria Initiative FY 2020 Nigeria Malaria Operational Plan, the proportion of pregnant women who received at least two doses of sulfadoxine-pyrimethamine (SP) more than doubled between 2013 and 2015 – from 17% to 41%. As a result, there was a significant decrease in malaria cases among pregnant women 2016 (31%), though the improvement in uptake was not sustained thus there was a return to 2015 levels in 2018 (i.e. 40% uptake of intermittent preventive treatment for pregnant women (IPTp). A similar pattern was reported for the proportion of pregnant women who received at least three doses of SP, although coverage has not returned to 2015 levels (7% in 2013, 21% in 2015, 15% in 2016 and 17% in 2018). Besides, some major factors hindering SP uptake among pregnant women in Nigeria include low antenatal care attendance rates, restrictions that prevent non-pharmacy workers from dispensing SP, missed opportunities during visits and non-availability.

Nigeria had a vision of zero death from malaria by 2020 and was making efforts to achieve the goal. Therefore, it is a thing of concern that despite the joint efforts by government its partners, Nigeria did not attain the Healthy Peoples 2020 objectives. This is because reduction in mortality relating to malaria or eliminating it requires community ownership and active participation (NMSP 2014-2020). Thus, World Health Organization in its Global Technical Strategy for Malaria (GTSM) has set new targets for a malaria free world which also include reduction of mortality rates and case incidence globally to at least 90% by 2030 (WHO, 2015).

1.1 Aim of the Review

This review sought to provide the most recent update on malaria prevalence among pregnant women in Nigeria using several studies and make necessary recommendations.

1.2 Objectives of the Review

- Review literatures on the prevalence of malaria
- Discuss the Pre-natal risk of malaria infection

Provide recommendations to stakeholders

2. Review of Related Literature

Prevalence of Malaria in Nigeria

Malaria is a major public health issue in Nigeria, with about 97% of the population at risk of malaria. *Plasmodium falciparum* is the predominant parasite species (95.1%) in the country, followed by *P. malariae* (1.6%), *P. ovale* (0.2%), and mixed species (4.1%) (National Malaria Elimination Programme (NMEP) 2010). Approximately 85 percent of Nigerians live in areas of mesoendemic transmission, and about 15 percent live in areas of hyper-holoendemic transmission. According to the 2021 World Malaria Report, Nigeria had the highest number of global malaria prevalence (27 % of global malaria cases) and accounted for the highest number of deaths (31.9% of global malaria deaths) and tops the list of high burden countries. Malaria also contributes to 11% maternal mortality.

This literature review presents, malaria prevalence in pregnant women from Nigeria six geo-political zones (South-west, South-east, South-south, North-central, North-west and North-east). Evidence from cross sectional studies conducted by different authors as seen in Table 1 shows that the North-east has the highest prevalence of 41.6%. However, a study from Bello et al. (2019) shows that the South-west recorded the lowest prevalence of 4.3% in malaria among pregnant women.

Table 1: Literature abstraction and outcomes of the included studies (n=6).

Lead Author	Year of Pub.	Study Design	Sample Size	Region	Prevalence (%)	Study Quality
Omatola, C. A.	2021	Cross-sectional	200	North -Central	22	Good
Ibeneme et al.	2017	Cross-sectional	128	South-East	41	Good
Wogu et al.	2013	Cross-sectional	400	South-South	26	Good
Bello et al.	2019	Cross-sectional	1570	South -West	4.3	Good
Fana et al.	2015	Cross-sectional	255	North-West	41.6	Good
Kwala et al.	2021	Cross-sectional	313	North-East	36.74	Good

2.2 Pre-natal Risk of Malaria Infection

Malaria in pregnancy is a significant health problem in sub-Saharan Africa where 90% of the global malaria burden occurs. Several studies have shown that malaria infection rate is higher in pregnant women because of their decreased immunity (Iyanda et al., 2020; Kwala e al., 2021). According to Okpere et al. (2010), about 30 million women are threatened by malaria in pregnancy annually with 10,000 maternal mortalities attributed to the disease each year and about 200,000 neonatal deaths annually. Moreover, pregnant women living in areas of low or unstable malaria transmission have little or no immunity to malaria and are at higher risk of developing the severe disease as a result of

malaria infection than non pregnant adults living in the same area. Some of the prenatal risks of malaria in pregnancy are abortion, stillbirth, premature delivery, and low-birth-weight infants (WHO, 2007).

However, Marchesini and Crawley (2004) posit that in unstable malaria transmission areas, maternal mortality may be due to complications of severe malaria (hypoglycaemia, cerebral malaria, and pulmonary edema) or indirectly from malaria-related severe anaemia. Brabin (2000) asserts that anaemia is the major adverse effect of malaria in pregnancy. Similarly, Dicko et al. (2003) posits that severe anaemia in pregnancy is an important contributor to maternal and pre-natal morbidity and mortality. Despite this fact, studies conducted to assess the prevalence rate of malaria among pregnant women in Nigeria have a great disparity and inconsistent findings.

3. Methods

3.1 Search Strategy

This Literature review was conducted to present the prevalence of malaria among pregnant women in Nigeria. Pertinent published articles were searched from electronic database: Google Scholar, MEDLINE and PubMed to identify studies conducted on malaria prevalence among pregnant women in Nigeria published from 2010 to 2021. The search terms were used in agreement with the Medical Subject Heading (MeSH) using the arrangement of key words which were used to select relevant studies. The search terms were used separately and in combination using Boolean operators like “OR” or “AND”. An example of search strategy used to retrieve relevant articles was as follows: prevalence [MeSH Terms]) AND malaria) OR malaria [MeSH Terms]) AND pregnant women OR pregnant women [MeSH Terms]) AND Nigeria. Duplicate studies were excluded.

3.2 Inclusion and Exclusion Criteria

Studies in which malaria has been diagnosed using microscopy, rapid diagnostic test, and carried out on symptomatic or asymptomatic pregnant women were included in this review. In addition, studies conducted in Nigeria among pregnant women attending ANC (Anti Natal Clinic) and community based studies among pregnant women; and contained the minimum information concerning sample size and status of malaria infection, which helped to analyze a pooled estimate of the prevalence of malaria among pregnant women in Nigeria were also included. All included studies were cross sectional. Nevertheless, studies done among women in the delivery unit, unknown methods of malaria diagnosis, and questionnaire-based studies were excluded.

3.3 Characteristics of the Population

The total population from the various studies analyzed was two thousand, eight hundred and sixty-six pregnant women between 15 and 45 years. All the women reside in rural and semi-urban areas in Nigeria.

Conclusion/Recommendation

This review has shown that there is high prevalence of malaria among pregnant women attending antenatal clinic in Nigeria. Early antenatal booking for effective monitoring and prompt treatment of malaria in pregnancy will contribute significantly in reducing maternal morbidity and mortality. In addition, it is imperative that routine intermittent preventive measures for malaria in pregnant women in these areas are scale-up. Available data reveals that protection against malaria contributes to the prevention of malaria in pregnancy, thus highlighting the importance and efficacy of chemoprophylaxis, use of insecticide treated net, other methods of malaria control and health education.

Therefore, it is necessary that every pregnant woman gets health educated on the importance of intermittent preventive treatment of malaria and use of insecticide treated nets in pregnancy. Educating them on the importance will further increase the acceptance of and adherence to these new preventive measures which are crucial to improving maternal health during pregnancy, by limiting placental malaria and its adverse effects on fetal outcomes. This will improve child survival and development, thus reducing the burden of malaria in endemic areas. Furthermore, the practice of presumptive treatment is of considerable concern for both the health of individuals and the increased risk it poses to their development of parasite resistance to the first-line treatment against malaria (WHO, 2010). Moreover, malaria interventions programmes should focus on behavioral change communication. These recommendations will be integral to the success and sustainability of intensified malaria control, subsequently leading to elimination of malaria in Nigeria.

References

- Amuta, E., Houmsou, R. & Wama, E. (2014). Malarial Infection among antenatal and maternity clinics attendees at the federal medical centre, Makurdi, Benue State, Nigeria. *Infectious Diseases Reports*, 6(1), 5050.
- Bello, F. & Ayede, A. (2019). Prevalence of malaria parasitaemia and the use of malaria prevention measures in pregnant women in Ibadan, Nigeria. *Annals of Ibadan Postgraduate Medicine*, 17, 124-129.
- Brabin, B. J. (2000). The risks and severity of malaria in pregnant women in Africa. Report no 1. 2000. Geneva: WHO: 1-43.
- Desai, M., Terkuile, F.O. & Nosten F. (2007). Epidemiology and Burden of malaria in pregnancy. *Lancet Infectious Diseases*, 93-104.
- Dicko, A., Mantel, C., Thera, M., Doumbia, S., and Diallo, M. (2003). Risk factors for malaria infection and anaemia for pregnant women in the Sahel area of Bandiagara, Mali. *Acta Tropical*, 89, 17-23.
- Fana, S.A., Bunza, M.D.A. & Anka, S.A. (2015). Prevalence and risk factors associated with malaria infection among pregnant women in a semi-urban community of north-western Nigeria. *Infectious Diseases of Poverty*, 4, 24. <https://doi.org/10.1186/s40249-015-0054-0>
- Federal Ministry of Health for malaria control in Nigeria (2004). A strategy for behavioural change communication. Abuja: FMOH; 1-16.
- Holding, P.A. & Kitsao-Wekulo, P.K. (2004). Describing the burden of malaria on child development: what should we be measuring and how should we be measuring it? *American Journal of Tropical Medicine & Hygiene*, 71(Supplement.2), 71-79.
- Ibeneme, Georgian & Matthew, Ojone & Nte, Nwode. (2017). Prevalence and effect of malaria in pregnancy among antenatal women in Ebonyi State, Nigeria. <https://doi.10.15739/irjpeh.17.021>.
- Iyanda, A. E., Osayomi, T., Boakye, K. A., & Lu, Y. (2020). Regional variation and demographic factors associated with knowledge of malaria risk and prevention strategies among pregnant women in Nigeria. *Women & health*, 60(4), 456-472.
- Kwala, K. H., Asika, A. I., & Adiel, T. (2021). Prevalence of Malaria Infection among Pregnant Women Attending Specialist Hospital Yola, Adamawa State, Nigeria. *South Asian Journal of Parasitology*, 5(2), 24-31. <https://journalsajp.com/index.php/SAJP/article/view/30143>
- Marchesini, P. & Crawley, J. (2004). Reducing the burden of malaria in pregnancy. MERA IV, supporting agency-Roll Back Malaria, WHO. 2004.
- National Malaria Elimination Programme. National Malaria Strategic Plan 2014-2020.
- National Population Commission (NPC) [Nigeria] (2010). National Malaria Control Programme (NMCP) [Nigeria], and ICF International. Nigeria Malaria Indicator Survey, Abuja, Nigeria.
- National Malaria Elimination Programme (NMEP) NPCN, National Bureau of Statistics (NBS), and ICF International: Nigeria Malaria Indicator Survey 2015. Abuja, Nigeria and Rockville, Maryland, USA: NMEP, NPopC, and ICF International; 2016.
- Nigeria Demographic and Health survey (2003): Field Report. National Population Commission, Measure DHS+Macro

- Okpere, E.E., Enabudoso, E.J. & Osemwenkha, A.P. (2010). Malaria in Pregnancy. Nigerian Medical Journal, 51(3), 109-113.
- Olver, C. (2012). "Global malaria mortality between 1980 and 2010: A Systematic Analysis". <https://journalistsresource.org>.
- Omatola C.A. & Okolo, M.O. (2021). Hepatitis B and Asymptomatic Malaria Infection among pregnant women in a semiurban community of North-Central Nigeria. Journal of Environment and Public Health. <https://doi.org/10.1155/2021/9996885>
- Sachs, J. & Malaney, P. (2002). The economic and social burden of malaria. Nature, 415, 680-685.
- Schantz-Dunn, J. & Nour, N.M. (2009). Malaria and pregnancy: a global health perspective. Reviews in Obstetrics Gynecology, 2, 186-192.
- Shulman, C.E. & Dorman, E.K. (2003). Importance and prevention of malaria in pregnancy. Transactions of the Royal Society of Tropical Medicine and Hygiene, 97(1), 30-35.
- United States Embassy in Nigeria (2011). Nigeria Malaria Fact Sheet <http://nigeria.usembassy.gov>.
- USAID President's Malaria Initiative FY 2020 Nigeria Malaria Operational Plan
- Wogu, M. N., Nduka, F. O., & Wogu, D.M. (2013). Prevalence of malaria parasite infection among pregnant women attending antenatal clinics in Port Harcourt, Rivers State, Nigeria. International Journal of Tropical Disease & Health, 3(2), 126-132. <https://doi.org/10.9734/IJTDH/2013/2738>
- WHO, "Gender, health and malaria," Health Policy (New York), vol. 52, pp. 267-292, 2007.
- World Health Organization (2012). World malaria report 2011. Geneva, Switzerland: WHO.
- World Health Organization (2019). World Malaria Report 2019.
- World Health Organization (2015). Global technical strategy for malaria 2016-2030.
- World Health Organization (28 October 2021). Malaria. <https://www.who.int/news-room/fact-sheets/detail/malaria>