A SIX YEAR REVIEW OF THE TRENDS IN PREVALENCE OF MALARIA INFECTION IN CHILDREN IN SECONDARY AND TERTIARY HEALTH CARE OUTLET IN ANAMBRA STATE, NIGERIA

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ABSTRACT

This study examined the trends of malaria infection among in children in the paediatric unit of some tertiary and secondary health outlet in Anambra State, Nigeria over a six year period. A retrospective study of malaria prevalence in children aged 0 – 14.9 years between January 2005 and December 2010 was conducted to establish the trends. There was an increase in the number of children with malaria infection from 2005 to 2010. Seasonal prevalence occurred with 52.3% malaria parasite infection during rainy season and 47.7% during the dry season. Children between the ages of 0 – 3 years had the highest malaria prevalence between 2005 – 2010. There was an overall yearly increase in the number of malaria cases which may be as a result of influx of mothers/caregivers to the hospitals for further treatment after initial home management of malaria in their children.

Keywords: Trends, Malaria, Prevalence, Children, Tertiary and secondary health outlet, Anambra State, Nigeria

INTRODUCTION

Malaria continues to claim one to two million lives a year, mainly those of children in sub-Saharan Africa. An estimated 3.2 billion people are at risk of malaria, of which 1.2 billion are at high risk. In high-risk areas, more than one malaria case occurs per 1000 population. Malaria killed 437,000 children before their fifth birthday in 2013, the majority in sub-Saharan Africa. According to the latest estimates, malaria mortality rates were reduced by about 47% globally and by 54% in the WHO African Region between 2000 and 2013 (WHO, 2014). Reduction in mortality depends, in part, on improving the quality of hospital care, the training of healthcare workers and improvements in public health (Ralph and Akyea 2013).

New analysis reveals that the prevalence of malaria parasite infection (including both symptomatic and asymptomatic infections) has decreased significantly in Africa since 2000. The number of people infected fell from 173 million in 2000 to 128 million in 2013 – a reduction of 26 %. This has occurred despite a 43% increase in the African population living in malaria transmission areas. Malaria is a major public health problem in Nigeria where it accounts for more cases and deaths than any other country in the world. Malaria is a risk for 97 % of Nigeria's population. The remaining 3 % of the population live in the malaria free highlands. There are an estimated 100 million malaria cases with over 300,000 deaths per year in Nigeria. Malaria has the least prevalence, 27.6 percent, in children age 6 to 59 months in the

South East region (United States Embassy in Nigeria, 2011).

WHO in 2011 recommended prompt parasitological confirmation by microscopy or Rapid Diagnostic Test (RDT) for all patients with suspected malaria before treatment begins. Artemisinin-based combination therapy (ACT) is the standard treatment of uncomplicated malaria. Prevention programs focus on the distribution and use of bed nets, called Long Lasting Insecticidal Nets (LLINS), including evidence-based health communication programs on the mode of malaria transmission and the importance of sleeping under ITNs. This study examined the trends of severe and uncomplicated malaria cases in General and Teaching Hospitals in Anambra State, Nigeria over a five year period.

MATERIALS AND METHODS

A retrospective study of malaria cases of children between January, 2005 and December, 2010 was conducted to establish the trends. The hospital records of the paediatric unit of the selected General Hospitals were studied and analyzed. Monthly diagnosis of malaria cases in eleven (11) General Hospitals was recorded. The hospitals purposefully selected for this study were: CHC - Comprehensive Health Centre, Atani, GHE - General Hospital, Ekwulobia, GHO - General Hospital, Osomala, GHA - General Hospital, Amanuke, GHEU - General Hospital, Enugu Ukwu, NATHU - Nnamdi Azikiwe Teaching Hospital, Umunya, GHI - General Hospital, Ifitedunu, GHAG - General Hospital, Agulu, AUTHA - Anambra State University Teaching Hospital, Awka, GHU - General Hospital, Umueri and GHN - General Hospital, Nnobi (Figure 1).

Data Analysis: Percentages were used to determine the prevalence of infection in each year and across gender and age groups.

RESULTS AND DISCUSSION

A retrospective studies on the prevalence of malaria from 2005 to 2010 in Anambra State using the hospital records showed that 2010 had the highest prevalence (27.5%) followed by 2009 (18.2 %), 2006 (15.5 %) and 2005 had the lowest prevalence of 11.7 % (Figure 1). Also from 2005 – 2010, the months of September, October and November had the highest prevalence of malaria infection (9.5 %) followed by June and August (8.9 %), July (8.8 %) December (8.5 %,), January 7.8 %, February 7.5 % May 7.4 %, March 7.3 % and April 6.5 % (Figure 2). There was 52.3 % malaria parasite infection during rainy season and 47.7 % during the dry season (Figure 3).

The retrospective prevalence of malaria infection in different secondary and tertiary hospitals in Anambra State, Nigeria, showed that Anambra State University Teaching Hospital, Awka had the highest infection (41.4 %) followed by Nnamdi Azikiwe Teaching Hospital, Umunya (27 %) and Umueri General Hospital had the lowest prevalence of 2.3 % (Figure 4).

Combined sex monthly prevalence of childhood malaria infection in the year under review showed that there was 9.5 % malaria infection in the months of September to November, followed by June and August (8.9 %), July (8.8 %) and December (8.5 %). The lowest prevalence (6.5 %) was recorded in the month of April (Figure 5).

Also the retrospective study showed that children between the ages of 0 – 3 years had the highest malaria prevalence from 2005 – 2010. The highest prevalence was recorded in 2010 (65.7%), followed by 60.9% (2008), 60.4 %, 60.2 %, 59.4 % and 59.1 % in 2009, 2007, 2006 and 2005, respectively. Children between the ages of 3.1 – 5.0 yeas had the highest prevalence of infection in 2007 (27.2 %), while those between 5.1 – 12 years had the highest prevalence in 2006 (14.2 %) (Figure 6).

There was progressive increase in percentage admitted cases of malaria in children, directly related to upward movement of years under review. This was in line with the study of Ralph and Akyea (2013) who reported a similar trend in a five year review of in-patient cases of malaria at the Children's Ward of Volta River Authority (VRA) Hospital, Akosombo, Ghana. This may be attributed to the malaria advocacy and education embarked upon by Anambra

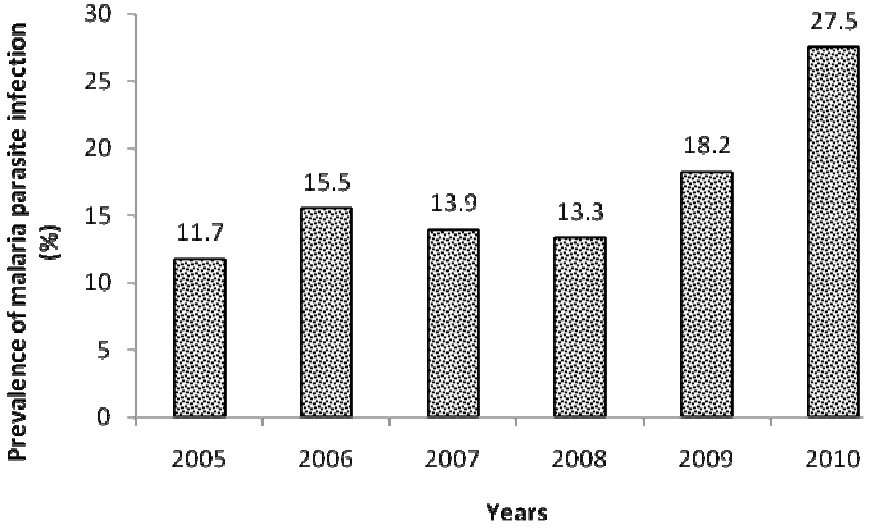

Figure 1: Prevalence of malaria parasite infection in Anambra State, Nigeria from 2005 – 2010

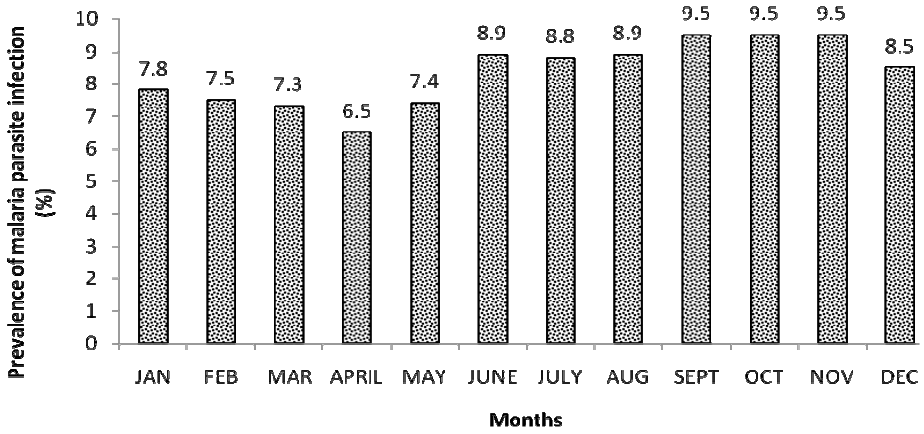

Figure 2: Monthly prevalence of malaria parasite infection from 2005 - 2010 in Anambra State, Nigeria

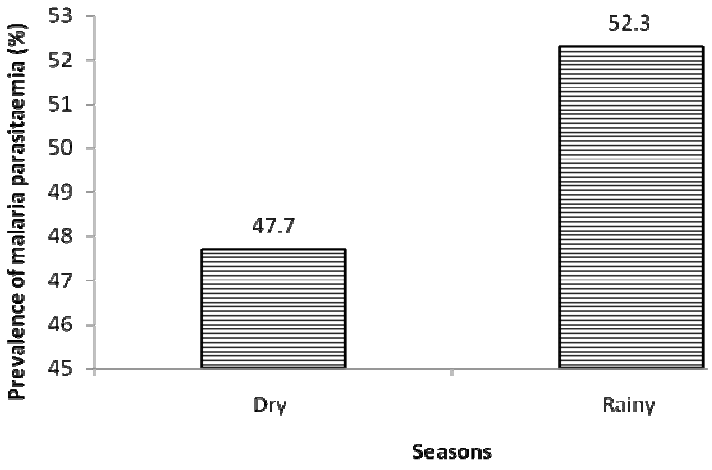

Figure 3: Seasonality of malaria parasite infection in Anambra State, Nigeria from 2005 – 2010

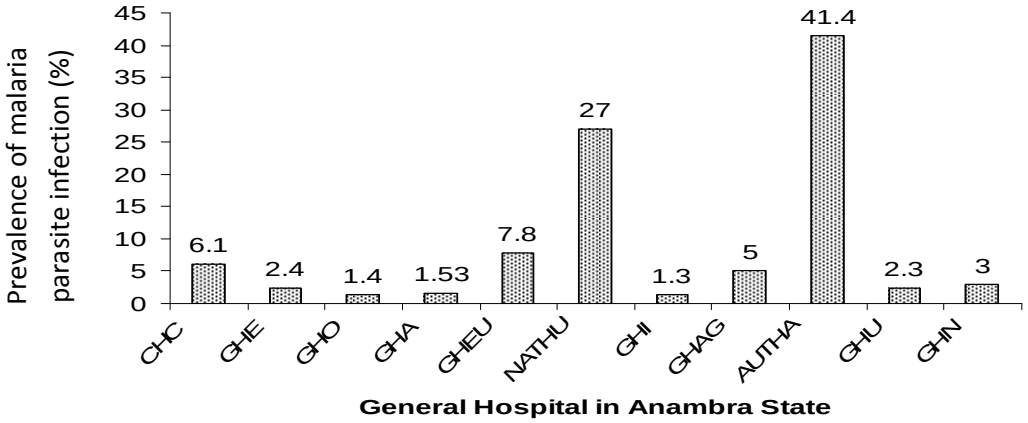

Figure 4: Prevalence of malaria parasite infection in General Hospitals in Anambra State, Nigeria from 2005 – 2010. Key: *CHC - Comprehensive Health Centre, Atani, GHE - General Hospital, Ekwulobia, GHO - General Hospital, Osomala, GHA - General Hospital, Amanuke, GHEU - General Hospital, Enugu Ukwu, NATHU - Nnamdi Azikiwe Teaching Hospital, Umunya, GHI - General Hospital, Ifitedunu, GHAG - General Hospital, Agulu, AUTHA - Anambra State University Teaching Hospital, Awka, GHU - General Hospital, Umueri and GHN - General Hospital, Nnobi*

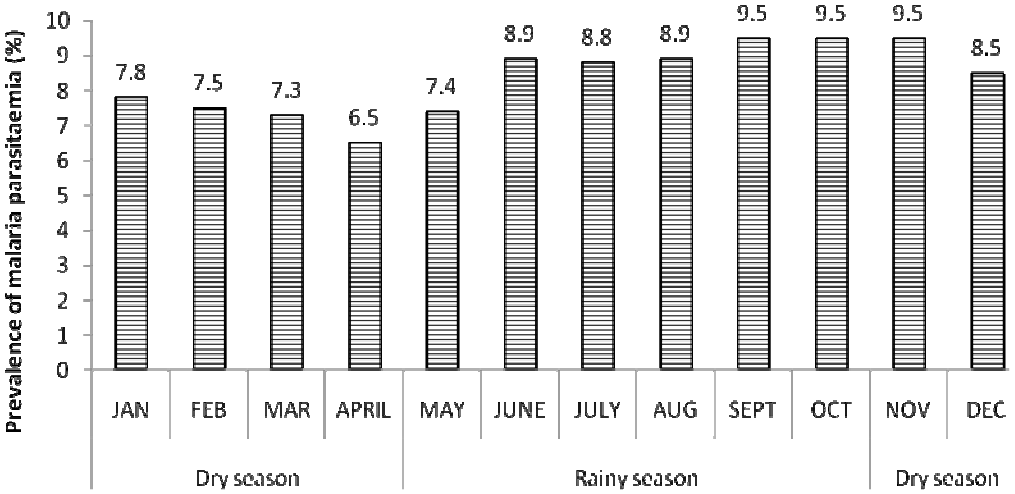

Figure 5: Combined monthly sex prevalence of childhood malaria infection from 2005 -2010 in Anambra State, Nigeria

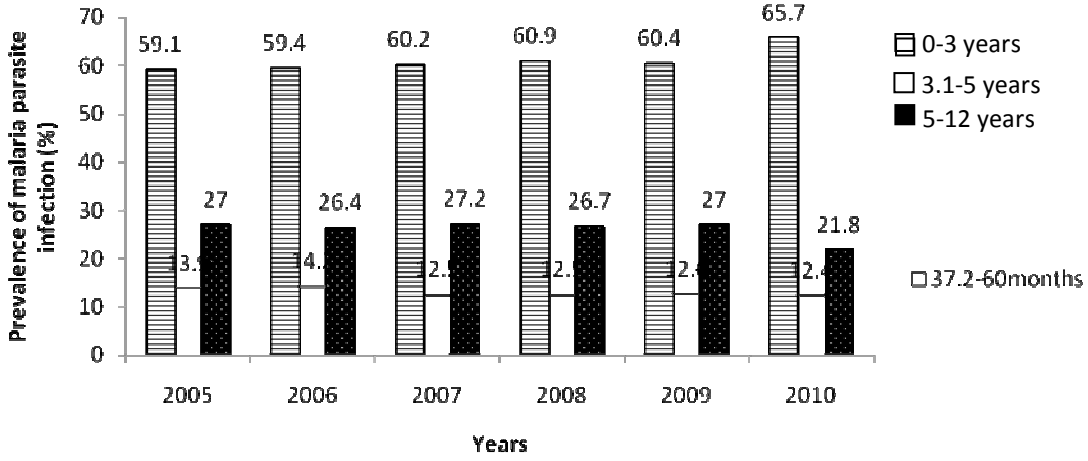

Figure 6: Age prevalence of malaria parasite infection in Anambra State, Nigeria from 2005 - 2010

State Government in line with the Federal Government policy to ensure effective control of malaria especially among the vulnerable groups (children under five years and pregnant women). Also this showed that there was significant improvement in the referral practises by the health workers at different levels of health care in the state.

The monthly prevalence of malaria infection over the years in focus showed that the months of January to December are suitable for malaria transmission in Anambra State, hence the presence of malaria infection in both wet and dry season (Ayanlade *et al.,* 2010; Iwuora, 2014). This is influenced by the availability of conditions suitable for malaria parasite transmission. The conditions that are suitable for both the development of *Plasmodium* and mosquitoes were defined as the coincidence of precipitation accumulation greater than 80 mm, mean temperature between 18^0 C and 32^0 C and relative humidity greater than 60% (Ayanlade *et al.,* 2010).

The result of this study showed that children between the ages of 0 – 3 years were persistently more infected than the other age groups in the year under review. This result was in line with the study of Alhaji (2012) and Austin *et al*. 2012). Further more 58.3% was reported for children aged 0 – 5 years in Awka, Anambra State (Mbanugo and Ejims, 2000) and 61 % recorded in Abuja (Matur *et al,* 2001). This may be due to the fact that at that age, their immunity to parasitic infections has not been fully developed.

In this study, it was found that tertiary hospitals had the higher prevalence of *Plasmodium* infection than the General Hospitals and Comprehensive Health Centres. This may be due to excessive visits of malaria patients and the improvement in further treatment behaviour of mothers/caregivers in the state.

Conclusion: There was an overall yearly increase in the number of malaria cases admitted to the paediatric unit of hospitals in Anambra State from 2005 to 2010 which showed improvement in the further treatment behaviour of mothers/caregivers but calls for effort in the improvement of integrated management and control of childhood malaria in the state.

REFERENCES

ALHAJI, S. (2012). *Prevalence of Malaria among Children Attending Two Hospitals in Gombe, Nigeria*. http://biopathways.blogspot.com.ng/2012/07/prevalence-of-malaria-among-children.html Accessed 6th June, 2013.

AUSTIN, N. I. R., ADIKAIBE, E. A. B., ETHELBERT, O. O., CHIOMA, U. E. and EKENE, N. U. (2012). Prevalence and severity of malaria parasitaemia among children requiring emergency blood transfusion in a tertiary hospital in Imo State, Nigeria. *Annals of Medical Health Science Research*, 4(4): 619 – 623.

AYANLADE, A., ADEOYE, N. O. and BABATIMEHIN, O. (2010). *Global Climate Change Imparts on Human Health in Sub-Sahara Africa.* http://spaa.2010.pinceton.edu/papers/100030. Accessed 13th March, 2014.

IWUORA, O. I. (2014). *Malaria Prevalence and Use of Insecticide Treated Nets in Anambra State, Nigeria.* http://naulibrary.org/dlibrary/admin/book_directory/Thesis/11026.pdf Accessed 2nd April, 2014.

MATUR, D. M. AZARE, B. A. and UGBONG, L. (2001). Prevalence of malaria parasites among undergraduate students of university of Abuja. *Nigerian Journal of Parasitology,* 22(1 and 2): 49 — 52.

MBANUGO, J. I. and EJIMS, D. O. (2000). *Plasmodium* Infections in children aged 0-5 Years in Awka Metropolis, Anambra State, Nigeria. *Nigeria Journal of Parasitology,* 21: 55 – 59.

RALPH, K. and AKYEA, K. B. U. (2013). *A Five Year Review of the Trends for In-patient Cases of Malaria at the Children's Ward of Volta River Authority (VRA) Hospital, Akosombo, Ghana.* MIM Book of Abstract 2013.

UNITED STATES EMBASSY IN NIGERIA (2011). *Nigeria Malaria Fact Sheet. www.http://Nigeria. usembassy.gov.* Accessed 6th June, 2013.

WORLD HEALTH ORGANIZATION (2014). *Malaria Vaccine Development.* www.who.int/malaria/ areas/vaccine/en/ Accessed 30th October 2014.