



Methods of Breast Feeding as Determinants of Malaria Infections among Babies in IMO State, Nigeria

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ABSTRACT: A survey on the methods of breast feeding as a determinant of malaria among breast fed babies was conducted between February and October, 2017 in Owerri Municipality in Imo State. A total of 400 babies between the ages of 0-2 years with their mothers were randomly selected from households and participated in the exercise. A well-structured questionnaire was used to source information from the mothers on their method of child breastfeeding and other demographic data. Blood samples were collected from the infants through finger pricking and were examined using the gold standard method of Giemsa stain of thin and thick film under X100 objective lens. Out of 400 infants encountered 123(30.75%) were exclusively breastfed and of these number, 15(12.20%) were positive of malaria parasite. Out of 277(69.25%) infants who were not exclusively breastfed, 111(40.07%) had malaria infection. Age range related malaria prevalence result among exclusively breastfed babies revealed that infection was higher among the age range of 19-24 months,(27.33%) and (62.86%) among the non-exclusively breastfed babies of the same age range while the least infected group were those of age range,0-6 months4.76% and19.39% respectively for both groups. Gender related prevalence result showed that males had the highest prevalence of malaria in both exclusively and nonexclusively breastfed babies, with 15.38% and 42.52%infection respectively. Statistically, infections were dependent on the methods of breast feeding and age range,($p < 0.05$)and independent on gender,($p < 0.05$). Low malaria prevalence observed among the exclusively breastfed babies coupled with other benefits makes exclusive breast feeding beneficial to mothers, babies and the society. Public health education and enlightenment campaign on exclusive breastfeeding should be highly promoted among child bearing mothers at the grass root level to create more awareness on its usefulness.

Keywords: Exclusive, breastfeeding, non- exclusive, and mothers.

I. INTRODUCTION

Exclusive breastfeeding,(EBF) is the practice of breast feeding a baby from birth up to six months of age before the introduction of any supplement(water/food) .On the other hand if the baby is given any other supplement(water/food) excluding multivitamins before six months ,the baby is said to be none exclusively

breast fed, (NEBF). Exclusive breast feeding is therefore, one of the very important public health strategies for the primary prevention of childhood morbidity and mortality all over the world.

Recently, there has been an increasing effort towards the promotion of exclusive breastfeeding as the breastfeeding method for new born babies (1). To a large extent, this idea has been encouraged by numerous scientific evidences on the importance of exclusive breastfeeding in reducing infant morbidity and mortality (1). In places where resources are not enough and where poor and suboptimal breastfeeding practices frequently result to childhood malnutrition which is a major cause of more than half of all child deaths, exclusive breastfeeding is regarded as an important strategy for infants' survival, (2). Indeed, of the 6.9 million under five children who were reported dead globally in 2011, an estimated 1 million lives could have been saved by simply practicing exclusive breastfeeding (3).

Malaria a mosquito-borne infectious disease is a major public health problem in the world and more especially among the pregnant women and children due to their vulnerability and as such has been described as one of most pressing global challenges. Approximately one half of the world's population is at the risk of malaria and millions of people die of the disease every year (4).

In spite of huge intensive worldwide effort been made to reduce its transmission, it still remains the most serious protozoan infection of humans in Africa and sub-Sahara nations of the world,(5,6). It has been reported that malaria is responsible for nearly 90% of deaths in Africa and that about 50% of Nigerians suffer from at least one episode of malaria annually with approximately 25million deaths being children under two years of age,(7). Malaria infection affects almost all who live in the part of Africa defined by Southern fringes of the Sahara desert. Most people at risk of the disease live in areas of relatively stable malaria transmission, while a small proportion live in areas where risk of the infection is more seasonal and less predictable due to either altitude or rainfall patterns(8).

Paediatric malaria is a global issue of public health concern that causes morbidity and mortality in many developing countries where young children are mostly affected (9). The World Health Organisation (10) has it that malaria kills every 30seconds and about 3000 children die every day all over the endemic nations. It is the cause of most low birth weight in new born babies and poor social and cognitive development among children,(11, 12,13).

Nigeria is one of the nations in the tropical Africa where malaria is endemic and poses a substantial health and developmental problem. Statistics show that as many as 600 lives especially children are lost in the country daily due to malaria because children are very much susceptible to malaria attacks due to low immunity and frequent exposure to the bite of anopheles mosquito vectors which complicate the attack,(14).

Breastfeeding is the natural methods of infant feeding from birth to weaning (14). Human milk contains the ideal balance of nutrient for a baby and provides valuable antibodies against infections. For the first few days after birth, breasts produce colostrum; a thick yellow fluid which contains less fat and sugar but more minerals and protein than breast milk. This colostrum has high content of lymphocytes and immunoglobulin which helps to protect the baby from infections. It is regarded as the first immunization of a new born and believed to transfer intellectual ability to the child (14).

Breast feeding remains one of the best feeding method for infant in the first six months of life and is a natural, cost effective and evidence –based nutritional activity that promotes the optimal well –being and survival of infants (15,16). It protects infant from severe morbidity in infancy and early childhood mortality especially those cause by malaria,(17).

Globally, about 60% of the 10.9 million infants and young children death occur due to inappropriate breast feeding practice and infectious disease where two –third of these deaths are attributable to sub- optimal breastfeeding practices. No more than 35% of infants worldwide are exclusively breast fed during the four months of life, complementary feeding begin too early or too late and food given are often nutritionally inadequate and purely unsafe for the infants,(16,18).

(19) and (20) defined breast feeding as the feeding of babies and young children with breast milk from a nursing mother with no supplement of any type except vitamins, minerals and medications when necessary up to six months after birth (21) states that health professionals recommend that breast feeding begins within the first hour of baby's life and continues as often and as much as the baby wants. Younger children, within first few weeks of life may feed roughly every two to three hours spending ten to fifteen minutes on each breast while the

older children feed less frequently and spend longer time. Frequency of sucking and duration are key determinants to how much milk is produced and to some extent the nutrient content of breast milk (22).

Globally about 385 of infants are breast fed during their first six months of life about 75% of women begin breast feeding and surprisingly only 13% breast feeds up to six months. However, this is not unconnected to some level of poverty, fear of breast fall, HIV transmission through breast feeding and other factors, (20). Consequently (18) it was reported that over 60% of the 10.9 million infants and young children die annually due to inappropriate or non-exclusive breastfeeding.

It was reported (9) that *Plasmodium* specie which is the causative agent of malaria and most important paediatrics infectious disease agent has been estimated to cause the death of over 600,000 peoples annually, most of whom are children less than 2 years of age. However new born and young infants less than 6 months of age are thought to be relatively protected from symptomatic malaria.

Despite the level of awareness and seemingly health consciousness nature of the people, there is still general untold hardship ravaging in the state that affects everyone including some nursing mothers. Thus many nursing mothers hardly see enough to eat so as properly breast feed their children. This research is therefore set to investigate the prevalence of malaria among breast fed and non- breast fed children in the study area.

II. METHODOLOGY

Study area

Owerri municipal is one of the twenty seven Local government areas the State, located on latitude 5.30N and longitude 7^o10E and lies in the tropical rainforest region of the south-eastern part of Nigeria. . Two seasons are prominent, the rainy season that spans from April to October and the dry season from November to March. Temperature varies from rainy to dry season with an average 0 and students of high institutions. Due the influence of state capital and many high institutions, the area is largely populated with clustered buildings and poor drainage systems that support the multiplication and transmission of mosquitos. The recent demolition of business areas led to proliferation of business centres all over the streets of the municipal and consequently, everywhere is littered with wastes that invariably encourage mosquito breeding.

Ethical clearance

This was obtained from appropriate authorities and individuals from the Local Government, heads of communities and households) before the commencement of the survey.

Study Design

The study is a household survey of the effect of method of breastfeeding on the prevalence of malaria among the babies in the area.

Study population.

A total of 400 Babies (0-2years, 123 exclusively breast fed and 277 non-exclusively breast fed) and their mothers randomly selected from households in the area participated. Through well-structured questionnaire administered, demographic data were obtained including consent for participation.

Specimen collection and Analysis

Blood samples were collected from the infants through finger pricking, gold standard methods of examining parasitological specimen using Giemsa stain on slides for both thick and thin films were prepared, stained and examined for malaria parasites under the microscope using X100 objective lens,(23). Thick films were used for identification of malaria parasites while the thin films were for specific species identifications.

III. DataAnalysis

The prevalence rate of the methods of breast feeding, age and gender were expressed as percentages of the total number of babies examined. Subsequently chi-square test was used to test significance of the data obtained ($p < 0.05$).

IV. RESULTS

The overall result obtained simply revealed that out of 400 babies examined, 123(30.75) were infected and out of which only 123(30.75%) were exclusively breastfed while 277(69.25%) were not exclusively fed. Of the 123

babies exclusively breast fed babies, 15(12.20%) had malaria infection while 111(40.07) of 277 non-exclusively breast children had malaria infection. Age range prevalence result among exclusively breast fed babies revealed that infection was higher among the age range of 19-24 months, 6(27.33%) while the least infected group were those of age range, 0-6 months, 2(4.76%). Among the non-exclusively breast fed children, age range result showed that the infection was higher among the age range of 19-24 with (62.86%) while the least infected group were those of the age range 0-6 months with (19.39%). The gender related prevalence result showed that males had the highest prevalence of malaria in both exclusively and non-exclusively breast fed children, (15.38%) and (42.52%) infections respectively with non-exclusively breast fed children on the lead.

Table 1: overall prevalence of malaria infection among babies .

Number examined	Number infected (%)	Number uninfected (%)
400	126(31.5)	274(68.5)

Table 1 shows that 31.5% of the babies examined were infected with malaria.

Table 2: Prevalence of malaria infection among babies in relation to method they were breast fed.

Method of breast feeding	Number examined	Number infected (%)	Number uninfected (%)
EBF	123	15(12.20)	108(87.84)
NEBF	277	111(40.07)	166 (59.93)
Total	400	126	274

$$X^2_{tab} = 3.841, X^2_{cal} = 30.68, df = 1$$

EBF; Exclusively breast fed NEBF; Not exclusively breast fed

Table 2 revealed that infection was higher among the babies that were not exclusively breast fed, 111(40.07%) while those exclusively breast fed had the least infection of 15(12.20%). Thus prevalence of malaria infection among babies is significantly dependent of the method they were breast fed, ($p < 0.05$)

Table 3: Age related prevalence of malaria among exclusively and nonexclusively breast fed babies

AGE RANGE IN MONTHS	NUMBER EXAMINED	NUMBER INFECTED, (%)	NUMBER UNINFECTED (%)
0-6	140	21(15.00)	119(85.00)
7-12	106	35(33.02)	71(66.98)
13-18	62	20(32.26)	42(67.74)
19-24	92	50(54.35)	42 (45.65)
TOTAL	400	126(31.50)	274(68.50)

$$X^2_{tab} = 7.815, X^2_{cal} = 40.01, df = 3.$$

Table 3 shows that malaria infection was higher among the age group 19 -24 with, 54.35% while age group, 0 - 6 had the least infection of 15.00%. Chi-square analysis therefore revealed that the babies rate of infection by malaria is significantly dependent upon their age range ($p < 0.05$)

Table 4: Gender related prevalence of malaria among the exclusively and nonexclusively breast fed children.

Gender	NUMBER EXAMINED	NUMBER INFECTED(%)	NUMBER UNINFECTED(%)
EBF			
MALE	39	6(15.38)	33(84.62)
FEMALE	84	9(10.71)	75(89.29)
NEBF			
MALE	127	54(42.52)	73(57.48)
FEMALE	150	57(38.00)	93(62.00)
TOTAL	400	126(31.50)	274(68.50)

$$X^2_{\text{tab}} 3.841 \quad X^2_{\text{cal}} 1.53 \quad df=2$$

Table 4 shows that male babies were more infected by malaria infection, 15.38% and 42.52% than the females with 10.71% and 38.00% respectively for exclusively and non-exclusively breast fed babies. However, statistically infection of the babies were significantly independent of their gender ($p < 0.05$)

V. DISCUSSION

Exclusive breast feeding has been described as the act of breast feeding an infant from an hour after birth and it has the potential of lowering child mortality to about 13% and has also been found to be highly protective against infectious diseases, hence the survival after all the attacks, (20). The works of (24, 25 and 26), revealed that exclusive breastfeeding prevents infection and other childhood diseases while Joel and Cesar, (27) states that exclusively breast fed baby gains more weight than those not exclusively breast fed.

The finding from these study therefore agree with the aforementioned findings and were purely shown on the result obtained from the study were 123(30.75%) out 400 children examined were exclusively breast fed and of these number, 126(31.50%) were positive for malaria.

Poor or low number of breast fed babies obtained in this study could be explained to show that many mothers are not fully educated on the importance of exclusive breast feeding and again poverty may have contributed to it since it is a well fed mother that can really practice exclusive breast feeding. How then can a woman who cannot afford three balanced meal practice this gold standard feeding method? It is either that she become malnourished or that the baby is poorly fed and may become ill, constituting another problem.

Of the 123 exclusively breast fed infants, only 15(12.20%) were malaria positive while 111(40.07%) out of 277 non-exclusively breast infants had malaria infection. These results agree with the work of (27) and (17) that had similar results. This is real since the rate of infection significantly depends on methods of breast feeding of the babies, ($p < 0.05$). This is true since breast milk has been found to protect the child against infections of all sorts, (20)

The age related prevalence of malaria among the exclusively breast fed and non-exclusively breast fed also showed that infection is milder with those exclusively breast fed and increases with as age progresses. This result is also justified by the works of (28) who suggested that it could be as result of the presence of colostrum which contains immunoglobulin in the nursing mothers that is highly protective and is transferred from mother to child through placenta before birth and lasts for a while even after birth but begins to diminish as the baby gets older. This is not possible since infections is also dependent in the ages of the babies, ($p < 0.05$)

Furthermore, haemoglobin F which is present in high concentration at birth can inhibit parasitic developments and therefore protect the baby within the first few months of life (29). Breast milk also has a protective compound like lactoferrin which binds iron needed by parasites for survival and SLGA antibody against the trophocyte and gametocyte stages of *falciparum*, (30).

Gender related malaria prevalence among the infants revealed that although male babies had more malaria infection than the females, statistically the infection is not significantly independent of their gender ($p < 0.05$) among the male and female babies in the EBF and NEBF. In each of these results, males were more infected than the female with more infections among the NEBF children. The reason for this difference in prevalence could be linked to the hyperactive nature of male children even from the womb and especially as they grow in

years. Thus the hyperactive nature of the male children which often leads to more exposure to mosquito bite may have contributed to the observed prevalence. However, the result obtained in this work showed that the infection rate is statistically independent of gender.

Generally, the high neglect of EBF by many mothers could be reasoned to be as a result of ignorance or poor awareness level of both mothers and their husbands. However, improved maternal educational status may enhance the mothers understanding of the importance of breast feeding their children effectively and the role it plays towards their protection from many parasitic and other childhood infectious diseases (35).

VI. CONCLUSION

Breast feeding babies exclusively significantly determines the level of malaria infection **they** suffer .This is shown by the level of malaria prevalence observed among the exclusively breastfed babies as against the none exclusively breast fed coupled with other benefits that made it exclusively beneficial to mothers, their children and the society. Exclusive breastfeeding of infants increase their resistance to parasitic infections and also increases their chances of survival since chances of being infected are reduced when babies are exclusively breastfed as observed in the present study.

To do this effectively mothers need support from their spouses, government and the entire society. Public health education and enlightenment campaign on exclusive breastfeeding should be highly promoted among women of reproductive age at the grass root level and if possible incentives should be made available to those mothers that exclusively breastfeed their babies.

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