Malaria and typhoid fever infection rates in pregnant women

ASSIGN BUSTER

Plasmodium falciparum and *Salmonella typhi* Co- infection Among Pregnant Women in Abakaliki, Ebonyi State Nigeria.

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Abstract

Malaria and typhoid fever are both endemic in the tropics and pregnant women constitute one of the high risk groups. This study was carried out to determine the rate of malaria-typhoid co-infection in pregnant women attending antenatal clinics in Federal Teaching Hospital, Abakaliki, Ebonyi State Nigeria. About120 volunteer pregnant women were recruited during routine antenatal. Malaria infection was determined by qualitative immunodiagnostic assay and confirmed by microscopic examination of thick and thin giemsa stained slides. Typhoid infection was determined by Widalagglutination method and confirmed by stool culture. Out of 120 pregnant women studied, 49 (40. 8%) were positive for malaria parasite and equally had significant titre of salmonella antibiotics. Of the 120 stool samples cultured 29 (24. 2%) were positive for salmonella. Thus, the overall rate of malaria-typhoid co-infection was 12. 5% by both Widalagglutination and stool culture methods. The co-infection of malaria and typhoid in pregnancy has a profound effect on adverse pregnancy outcome. Weadvocate for routine screening and treatment of infected pregnant women.

Keywords: Co-infection, Malaria and Typhoid, Pregnant Women, Ebony State, Nigeria

INTRODUCTION

Malaria and typhoid fever (caused by plasmodium falciparum and salmonellaspp respectively) are both diseases of public health importance which are endemic in both tropical and subtropical countries including Nigeria. The association between typhoid and malaria was first described in medical literature in the middle of the 19 th century by the United States Army and was erroneously called " typho-malaria fever" (Smith, 2002). Recent studies in Africa seem to corroborate the relationship between malaria and typhoid fever (Ammah *etal* ., 2009). It is noteworthy that the socio-economic and environmental condition that tend to sustain high prevalence of malaria in endemic areas also favour the transmission of *salmonellatyphi* , the causative agent of typhoid fever. (Prasanna *etal* ., 2011)

The World Health organization has estimated that in 1995, 219 million cases of malaria were documented with about 1. 2 million deaths (Brabin 1983). Malaria infection often presents with head ache, fever, shivering, arthralgia (joint pain), vomiting, hemolytic anaemia, jaundice, hemoglobinuria and retinal damage (Brabin, 1983; Gills *etal* ., 1999). Complications of malaria involve respiratory distress, which occurs in up to 25% of adults and 40% of children. Acute Respiratory Distress Syndrome (ARDS) may develop in 5-25% in adults and up to 29% of pregnant women, although it is rare in young children (Isibor, *et* . *al* ., 2011).

Pregnant women are especially vulnerable to malaria infection. In Sub-Sahara Africa, maternal malaria is associated with up to 200, 000 estimated infant deaths yearly (Isibor *etal* ., 2011).

Typhoid fever is considered a particular risk in pregnancy because of reduced peristaltic activity in the gastro-intestinal and biliary tracts and increased prevalence of biliary " sludge" (Bashyam *etal* ., 2007).

Materials and method

Area

The study was carried out at the antenatal clinic, Federal Teaching Hospital, Abakaliki, Ebonyi State.

Study population

The study involved pregnant women who had fever by the time of their visit to the hospital.

Sample collection

Intravenous blood sample (5ml) was collected from each participant. The samples were stored in refrigerator after collection and were processed within six hours. Stool samples were also collected from participants using sterile universal containers.

Determination of malaria infection

This was carried out using antigen Rapid Test Device method as well as Giemsa stained thick and thin blood smear for microscopic detection of *P . Falciparum* . Both procedures were carried out as described by Cheesbrough, (2002).

Widal test

Widal agglutination test was performed on all malaria positive blood samples using commercial antigen suspension and the procedure was as described by the manufacturer.

Also stool culture was done to further confirm *S. Typhi.* 10ml of selenite- F broth was added to 3g of the stool sample and mixed vigorously, and then incubated at 37 ^{o} c for 24hours. Thereafter, a loopful of the sample was inoculated onto salmonella-stigella agar medium and incubated at 37 ^{0} c for 24 hours to get discreet colonies (Lactose fermenters were confirmed by pink colonies on SSA). The colonies were Gram stained and further subjected to biochemical analysis.

Results

Out of the 120 pregnant women at their different stages of pregnancy that participated in this present study, 49 (40. 9%) were positive for malaria, while 29(24. 2) tested positive for *S. typhi.* Malaria infection was highest during the first trimester (16. 7%) while *S. typhi* was more prevalent during the third trimester. The overall malaria and typhoid fever co-infection showed a prevalence of 12. 5% (see table 1).

Table 1: prevalence of *P. falciparum* and *S. typhi* among women in different stages of pregnancy

Stages of pregnancy	N0 examined	P. falciparum	S. typhi	Co-infection
1 st trimester	40	20(16. 7%)	8(6. 7%)	5(4. 2%)
2 nd trimester	30	11(9. 2%)	6(5%)	4(3. 3%)
3 rd trimester	50	18(15%)	15(12. 5%)	6(5%)
Total	120	49(40. 9%)	29(24. 2%)	15(12. 5%)

Table 2 and 3 below shows the comparative methods employed during this study. Both RDT and Microscopy methods were considered desirable as they gave positive result *P. falciparum* at all stages. Similarly, both widal test and culture methods gave confirmatory positive results for *S. typhi.*

Table 2 comparative test for malaria using rapid diagnostic test and microscopy.

Stage of pregnancy	RDT (%)	Microscopy (%)	Number examined
1 st	20(16.	20(16. 7)	40

	7)		
2 nd	11(9. 2)	11(9. 2)	30
3 rd	18(15)	18(15)	50
Total	49(40. 9)	49(40. 9)	120

Table 3 comparative Test for *S. typhi* by the widal and culture methods

stages of pregnancy	Widal (%)	Stool culture (%)	Number examined
1 st	8(6. 7)	8(6. 7)	40
2 nd	6(5)	6(5)	30
3 rd	15(12. 5)	15(12. 5)	50
Total	29(24. 2)	29(24. 2)	120

Discussion

Malaria and its co-infection with typhoid fever is a major public health problem in pregnant women in Nigeria. The malaria prevalence rate of 40. 9% observed in the present study suggests high endemicity and transmission of malaria parasite. The high prevalence suggests increased

susceptibility of pregnant women to malaria infection often due to induced immunosuppression (Nduka *etal* ., 206). The high prevalence could also be attributed to lack of adequate preventive measures being adopted by the pregnant women. Pregnant women in their first trimester were more infected with malaria as recorded in this study and this was in line with the earlier findings of Ukibe *etal* ., (2008). This could attributedto the absence of medical facility or the inability of the pregnant women to register for antenatal on time.

The prevalence of malaria-typhoid co-infection among the pregnant women attending antenatal clinic in this study was 12. 5%. This is comparable to previous reports (Akinyemi *etal* ., 2007; Prasanna, 2011). The observed prevalence suggests that typhoid fever is a common co-infection in malaria infected women in this part of the country. The reduction of cellular and humoral immunity which occurs in pregnancy renders pregnant women susceptible to other infections including typhoid fever (Scholarpurka, *etal* ., 2000). Malaria infected pregnant women are said to be more prone to typhoid fever because of the increased heamolysis in malaria which is said to increase the availability of iron in the tissue especially the liver and salmonella species are believed to thrive more in iron rich tissues (Kaye and Hook, 2003). It is pertinent to note that both typhoid and malaria in pregnant women present with management problems since most drugs used in the treatment of both diseases are contra-indicated in pregnancy. Also both diseases have been associated with pregnancy outcomes such as premature deliveries, spontaneous abortions, low birth weight and intra-uterine foetal deaths (Nasem *etal* ., 2008).

The transmission of *P . falciparium* and *S . Typhi* is affected by environmental factors such as poor environmental sanitation, poor housing and inadequate safe water supply. This could be reason for the high prevalence since majority of the pregnant women were rural dwellers. Te use of insecticide treated net, safe water supply and personal hygiene as well as early registration for antenatal clinic of pregnant women are advocated.

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