Original Article

Frequency of Malaria Among Pregnant Women

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Muhammad Abas Khan

ABSTRACT

Objective: To find out frequency of malaria among pregnant women who presented to a tertiary care hospital in Peshawar.

Study Design: descriptive study

Place and Duration of Study: This study was conducted at the Department of Medicine, Lady Reading Hospital, Peshawar, from December 2020 to May 2021.

Materials and Methods: Data collection was done by non-probability consecutive sampling technique. Patients who were pregnant and above 15 years of age were involved in the study. Frequency of malaria was established. Data was evaluated using SPSS version 23.

Results: Among 140 pregnant women patients, 30(21.4%) patients were diagnosed having malaria. The mean age was 30 ±11.62 years. malaria was found in 30 (21.4%) patients with pregnancy. In the positive blood samples, 24(80%) were infected with plasmodium falcipram and 14(10%) were infected with P.malairia,7(5%) with p.vivax and 7(5%) with P. falciparum. Women with age group of 20-30 years were found more prone to the plasmodium infection. In maximum patients, plasmodium density 1 was noted.

Conclusion: increased frequency of malaria in patients having pregnancy was noted

Key Words: Malaria, Pregnant Women, Parasitemia

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INTRODUCTION

Malaria is a chief public health challenge.228 million cases of malaria happened globally and 405,000 deaths occurred in 2018. Maximum cases of malaria (93%) and deaths (94%) happened in the World Health Organization Africa Area, with Plasmodium falciparum which accounted for 99.7% of the cases [1]. Women having pregnancy are at high malaria risk[2,3]. In sub Saharan Africa 11 million out of 38 million (29%) pregnant women had been exposed to malaria in 2018 [1]. Though frequently asymptomatic, P. falciparum infection during pregnancy is related with harsh pregnancy consequences e.g. low birth weight, stillbirth, pre-term delivery, anemia in mother and abortion[4–6]. Frequency of malaria in women having pregnancy heightens in the 2nd trimester. Malaria in pregnant women is valuable indicator for surveillance of malaria at level of community [7,8] with commonest risk factors of young age and a prim gravida [2,9,10].

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In Pakistan 3.5 million established malaria cases are stated every year. As stated by world health organization in 2018[11], Pakistan is amongst the 6 World health organization Eastern Mediterranean countries having around 100 percent of the population at risk. Plasmodium vivax parasite is commonly found in Pakistan but P. falciparum is increasing from 35 to 40 percent[12]. Nearly 300 to 500 million people are effected from malaria and 2 to 3 million peoples dies every year[13]. Fifty million women having pregnancy are infected with malaria called (PAM) pregnancy-associated malaria globally and 2,500-10,000 maternal deaths occur each year [14-15].

5 diverse human malaria species are found E.g P. vivax, P. falciparum, P. malariae, P. ovale and P. knowlesi. In 2016 216 million malaria cases and deaths of 445,000 cases happened globally[16]. Malaria is transmitted over 91 countries and 80 percent of cases occurred in countries from sub-Saharan African region [16,17]. Every year 25 million women who were pregnant in sub-Saharan Africa are at P. falciparum risk. 2 institution-based studies conducted amongst women with pregnancy in Nigeria displayed malaria frequency as 41.6%[19] and 7.7% [19]. Additional study in Eastern Sudan disclosed 13.7% of women with pregnancy had P. falciparum[20]. Studies in Burkina Faso [21], and Malawi[22] displayed the frequency to be 18.1%, and 19% separately. One community-based study done in Ethiopia disclosed the frequency of malaria amongst women with pregnancy to be amid 2.83 and 16.3% [23–25]. Malaria in pregnant women is risk to fetus and mother[26]. Malaria leads to anemia in mother, premature delivery, spontaneous abortion, low birth weight and

fetal death[27,28]. Anemia related to malaria effects 10,000 maternal deaths every year in Africa[29]. Risk factors for malaria include age[19,31] educational status[22,31] gravidity, gestational age[32], parity[22,33] and Insecticide Treated Net usage[25]. In spite of higher risk malaria there is partial proof around malaria load amongst women with pregnancy. Hence, a requirement was sensed to find the frequency of malaria in women having pregnancy in our local situation. Objective of this study was to find the frequency of malaria in women having pregnancy who presented with fever in tertiary care hospital. This study will generate local data and generate attentiveness in physicians, and epidemiologists concerning frequency of malaria in women having pregnancy**.**

MATERIALS AND METHODS

This descriptive study was conducted at the Medicine department, Lady Reading Hospital Peshawar from December 2020 to May 2021. Data collection was done by non-probability consecutive sampling technique. patients who were pregnant of any duration presenting with history of fever and age above 15 years of age were included in the study. Patients having no pregnancy and having fever due to other etiology were excluded. Patients who were previously diagnosed as malaria based on medical records were taken as chronic malaria and were excluded from study. Sample size was 140 patients and was calculated on the basis of 10% frequency of malaria in women having pregnancy with 95% confidence level and 5% absolute precision[34]. clinical malaria was operationally defined as having malaria parasite in blood and a temperature in axilla of ≥ 37.5 °C or a having fever within the previous 48 hours, while asymptomatic malaria was defined as any level of parasite in the blood without fever. Patients having fever with headache or loss of consciousness with malaria parasite positive were diagnosed as cerebral malaria. Ethical Approval was taken from institutional ethical committee and the research was conducted on the principle of Helsinki declaration. Informed written consent was taken from each patient or their attendants after the aim of our study was explained and making them assure of confidentiality. All patients having malaria were confirmed with thick and thin smears and rapid antigen detection. Patients admission was done in medical unit of Lady Reading Hospital, Peshawar through outpatient and emergency department.

Malaria blood slides were prepared in Unit of parasitology in lrh Peshawar. Briefly, 2 µL and 6 µL of blood was utilized to make thin smears and thick smears, respectively. Thin smears fixation was done on absolute methanol, allowing it to air dry and both thin and thick smears staining was carried out with 10% Giemsa stain in phosphate buffered water (pH 7.2) for ten minutes. Thick film examination was done utilizing a Microscope with × 10 eyepiece and ×100 oil immersion objective to find the existence, type and stage of parasite. Thin smears were utilized to confirm type and count of parasites. Parasite density (parasites per µL of blood) calculation was done utilizing WBC (white blood cell) or RBC (red blood cell) count of participants determined on an automated hematological analyzer. An examination of minimum of 100 fields were done before a slide was marked to be negative. History and physical examination was carried out and thermometer was used to measure the fever. Neurologic system was examined in detail to assess the level of consciousness in cases of cerebral malaria. Also abdominal ultrasound was performed to look for hepatosplenomegaly. All other relevant investigations (blood sugar level, serum creatinine, complete blood count and erythrocyte sedimentation rate). Moreover, categorization was done as plasmodium falciparam, plasmodium vivax, plasmodium ovale and plasmodium malaria. Analysis of data was done utilizing SPSS version 23. Percentages and frequencies were used for categorical or qualitative variables like frequency of malaria, gender etc. calculation of SD and mean was done for numerical or quantitative variables malaria duration and age. Chi square test application was done for comparison of malaria frequency in both genders. P value <0.05 was considered significant.

RESULTS

In 140 patients having prenancy, 30(21.4%) patients were diagnosed as having malaria. The patients age ranged between 15 to 60 years (mean 30 ±11.62 years) with most patients between 20-50 years (mean 66.18 ±11.91 years). Patients who had malaria parasite were in the age group of 20-30 years followed by 30-40 years and then 40-50 years (detail in Table 1). Patients were from different districts of Khyber Pakhtunkhwa with inclusion of (FATA) federally Administered Tribal Areas. Majority of the patients were belonging to District Peshawar 58 (41.43%) persuaded by Charsadda 33(23.57%), Nowshera 14(10%) Swabi 15(10.71%), Mardan 20(14.29%) and other districts 15(10.71%).

Table No.1: Age wise distribution of malaria in pregnant women

Maternal age	Malaria in pregnant women		
	Yes	no	
<20	5(16.67%)	10(9.09%)	15(10.7%)
20 to30	12(40%)	44(40%)	56(40%)
30 to 40	10(33.33%)	39(35.45%)	49(35%)
40 to 50	3(10%)	15(13.63%)	18(12.8%)
50 to 60	0(0%)	2(1.81%)	2(1.42%)
Total	30 (21.4%)	110 (78.6%)	140(100%)

In total of 140 patients having pregnancy, malaria was noted in 30 (21.4%) cases. In these patients plasmodium falcipram was found in 24(80%) of cases.

Plasmodium malaria in 14(10%). Plasmodium ovale 7(5%) and plasmodium vivax in 7(5%). Table no 2.

Table No.2: Types of malarial parasites isolated

Malaria parasite type	Total
Plasmodium Falcipram	24(80%)
Plasmodium malaria	14(10%)
Plasmodium ovale	7(5%)
Plasmodium vivax	7(5%)

Overall frequency of malaria parasite in the blood was 21.4%. The frequency of malarial parasite in the blood was high in women aged < 25 years that is 101(72%) patients in comparison to those ≥ 25 years 39(28%), (table 3) and also higher in prim gravidae 95(68%) in comparison to patients who were multigravida 45(32%) (table 4). Plasmodium falciparum was found in highest number.

Table No.3: Frequency of malarial parasite according to age of patients

Age of patient	Number of patient with malarial parisite
<25	101(72%)
>25	39(28%)
Total	140(100%)

Table No.4: Frequency of patients having malarial parasite according to parity of patients

parity	Number of patients with malarial parasites
Primary gravida	95(68%)
multigravida	45(32%)
total	140(100%)

Number of plasmodium parasite per field under microscope called as plasmodium density. The extreme Plasmodium vivax density was recorded 3 in 5 patients, whereas the lowest Plasmodium vivax density was 2 in 7 patients. The Plasmodium vivax density 1 was recorded in 3 patients. Similarly, 5 patients have lowest of 02 Plasmodium falciparum density, while 10 patients have extreme 02 Plasmodium falciparum densities (Table 5).

Table No.5: Plasmodium density in pregnant women

number	P.vivax density	number	P.falciparm density
3	1	10	2
7	3	5	2
5	3		

DISCUSSION

in our study the frequency of malaria was 21.4% which is similar to study completed by khan F et al in 250 pregnant women where result was 22.8%.[33].the minor variance is because of comparatively larger sample size in khan F et al study.in khan F et al study Amongst the positive, 52 (20.80%) samples of blood were P. vivax and 5 (2.00%) samples of blood were P. falciparum. it is in different to our study in which plasmodium falciparum was noted in high frequency 80% followed by plasmodium malaria 10%, in maqsood A et al study Plasmodium Vivax found in frequency of 55.8%, P. Falciparum for 41.9%, and P. Ovale 2.3% of infections.in another study done by doso et al in 1655 pregnant women over all frequency of malarial parasite was 20.4% which is similar to our study results.in this study frequency was maximum (33.2%) in primi and secondi gravidae having age < 25 years and lowermost (14.1%) in multi gravidae having age greater than 25 years. This is again similar to our study.[34] In Gontie et al study the frequency of malaria was noted as 10.2% which is lesser than our study because a whole of 498 patients having pregnancy were involved in study. Two studies done in Nigeria disclosed the frequencies to be 58% because malaria is endemic in Nigeria[35]. In omer SA et al in which a whole of 836 women with pregnancy were observed where 219 (26.2%) were infested with Plasmodium falciparum. According to it persons having age between 21-30 years were mostly vulnerable to plasmodium and is in similarity with the present study.[36] In Adefioye OA et al study who carried out examination of 250 blood samples, amongst these 180 (72%) were having Plasmodium falciparum. individuals having age 36-39 years were having high frequency 15 (88.2%), while those having age (>40) years were having lesser susceptibility to the malaria parasite i-e 2 (40.00%)[37].

CONCLUSION

So it is decided that the malaria is very grave and lethal in women having pregnancy as in majority of cases it leads to abortion. In addition to this the study helps us for the enhancement of control of malaria and other deliberate plan amongst the pregnant women who are pregnant in Khyber pukhtoonkhwa.

Recommendations: Patients having pregnancy presenting with fever need to be evaluated for the presence of malaria. Suitable preventive and therapeutic measures are needed in patients with pregnancy presenting with fever to reduce related morbidity and mortality duty to malaria.

Author's Contribution:

Concept & Design of Study:	Muhammad Abas Khan
Drafting:	Muhammad Abas Khan
Data Analysis:	Muhammad Abas Khan
Revisiting Critically:	Muhammad Abas Khan
Final Approval of version:	Muhammad Abas Khan

Conflict of Interest: The study has no conflict of interest to declare by any author.

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