Original Article

Prevalence of Malaria

Study to Estimate the Prevalence of Malaria Infection in Sukkur

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ABSTRACT

Objective: The aim of the study to estimate the prevalence of malaria amongst the population with fever or history of fever at sukkur.

Study Design: Cross sectional study

Place and Duration of Study: This study conducted at laboratory Ghulam Mohammad Mahar Medical College Hospital Sukkur from January 2011 to December 2012.

Materials and Methods: Total 1746 clinical suspected case of malaria were included in the study. Patients presenting with fever were screened, thick and thin blood films prepared on microscopic glass slide, stained with 5% Giemsa's stain.

Results: There were 344 cases below 11 years, 590 cases between 11 to 20 years.812 cases above 20 years. They were 960 males and 786 females, with male to female ratio 1.2:1 .The prevalence of plasmodium slide positivity was 7.9% (138/1746). Among plasmodium slide positive, 60.5% (83/138) were positive for P.vivax and 39.5% (55/138) were positive for P. falciparum.

Conclusion: Identification of malaria cases in early acute phase of disease is significant for proper curative treatment. Anti mosquito eradication measures should be taken for breeding places of vector with personal protection measures and awareness program for malaria should be initiated.

Key Words: Anopheles mosquito, P. falciparum, P. vivax.

INTRODUCTION

Malaria infection is a global public health problem. The name malaria is derived from the Italian mal aria meaning bad air.[1] The disease was also known as paludism from the Latin palus (marsh).[2] Both names reflect that in ancient times, disease was believed that disease was spreading from marshy and swampy places.[3]

Grassi, feletti and Welch (1890 - 1897) proved that malaria is transmitted by one human to another by bite of infected Anophelese mosquito. The disease affects 109 countries in the World.[4]

WHO estimates that 216 million cases each year.[5] Approximately over half of million people die from malaria, mostly children younger than 5 years old.[6] Estimated number of Annual malaria cases in Pakistan is 1.5 millions.[6,7] The development cycle of vector requires hatching of eggs in standing water, in temperature between 16 °C to 38 °C. Rice crop cultivation provides breeding sites for parasite and influence incidence and prevalence of disease.[8,9] The most common region of malaria reported by C.D.C was Africa (58%), Asia (18%) and South America (16%). Malaria is transmitted to man by intracellular plasmodium protozoa, P. falciparum, P. malaria, P. ovale and P. vivax. The predominant species in Pakistan is P. falciparum and P. vivax.[10]

Children and adults are asymptomatic during initial phase of malaria infection. The usual incubation period for P. falciparum is 9-14 days and P. vivax is 12-17 days. The incubation period can be as long as 6-12 months for P. vivax. The disease is characterized by fever, chills, sweats, fatigue, anemia, thrombocytopenia, headache and anorexia.[11,12]

P. falciparum is most severe form of malaria and associated with more parasitemia. Fatality rate is up to 2.5% in adults and 30% in infants, if treatment is not started promptly. P. vivax results in parasitemia upto 2%. P. falciparum infects both Immature and mature erythrocytes. P. vivax infects primarily immature erythrocytes.[13,14]

Hozhabri et al (2000) studies the prevalence of plasmodium slide positivity among the children treated for malaria at R.H.C Jhangara Sindh, Pakistan. They observed the prevalence of plasmodium slide positivity was 5.9%.[15]

The prevalence of community based study done in rural sindh by Covel and Lieut (1934) epidemic of malaria. They found 40% malaria positivity at that time. Malaria diagnosis was based on splenetic rate (percentage of children between 2-10 years of age showing enlargement of spleen).[16]

The prevalence for malarial infection studies has been conducted in many parts of the Pakistan, but still lacking in many areas. A present study was conducted to estimate the prevalence of malaria infection suspected cases in Sukkur.

MATERIALS AND METHODS

This study was under taken at Ghulam Muhammad Mahar Medical College (GMMMC) Hospital, Sukkur among suspected patients of malaria, during the period of two years (January 2011to December 2012). The patients were including in the study if they met the

eligibility criteria. The age grouping of the patients was divided in to 3 categories: 2 months to 10 years of age, 11 – 20 years and 21 years and above.

The specimen was collected from patients after cleaning the skin with 70% rectified sprit to minimize the chance of contamination. 3 ml of intra venous blood was by drawn into EDTA vacutainer tube and information about age and sex were recorded. All the patients underwent a general examination for dehydration, anemia, spleen enlargement, jaundice and other abnormalities. Body temperature was also recorded by using a standard oral mercury thermometer. Thick and thin blood film were prepared through the through the blood sample in the pathology laboratory of the hospital. Thin film was fixed with 1 – 2 drops of methanol to avoid dehemoglobinization of RBCs while thick films were not fixed with methanol. The slides were pleased in staining jar, containing 5% Giemsa's stain for 20 minutes. After staining, air dry film was examined. 100-200 fields were examined under oil immersion objective (100 X) before being declared negative. Thick blood film were examined for quickly scanning of parasite while thin blood film for identification of malaria parasite species.

Those films that were malaria parasite positive, we identified different species such as P. falciparum and P. vivax.

RESULTS

Total 1746 cases were screened during period of January 2011 to December 2012. 960 cases were males and 786 were females. Ages of patient ranged from above 2 months to 80 years. Male to female ratio was 1.2:1. Mean age was 21 years. The malarial slide positivity was 7.9% (138/1746). Among the positive cases P. vivax were 60.2% (83/138) and P. falciparum (55/138) were 39.8%.

In 83 positive cases of P. vivax, patients aged below 11 years were 60.6% (23/83), from 11 to 20 years were 55.8% (24/83) while in patients above 20 years were 63.2% (36/83). Among P. falciparum positive cases (55/138), 39.4% (15/55) were under 11 years, 44.2% (19/55) were aged from 11 to 20 years while 36.3% (21/55) were above 20 years.

The seasonal variation of disease was also noted in this study. It was observed that high infection rate of P. falciparum was found in month of January while it was lower in the month of April. Higher rate of infection with P. vivax was observed in November and low in the month of January.

Table No.1: Month wise prevalence of malaria infection in sukkur (years 2011& 2012)

Month	Patients*	MP (+ve)**	Infection (%)	P. vivax (%)	P. falciparum (%)
January	157	17	10.82%	01 (0.63%)	16 (10.19%)
February	135	06	4.44%	02 (1.48%)	04 (2.96%)
March	212	05	2.34%	02 (0.94%)	03 (1.4%)
April	148	02	1.35%	01 (0.67%)	51 (0.67%)
May	94	06	6.37%	05(5.31%)	01 (1.06%)
June	119	09	7.56%	06 (5.04%)	03 (2.52%)
July	133	09	6.75%	07 (5.26%)	02 (1.50%)
August	130	08	6.15%	06 (4.61%)	02 (1.54%)
September	151	10	6.62%	06 (3.97%)	04 (2.64%)
October	124	20	16.12%	12 (9.67%)	08 (6.45%)
November	224	40	17.84%	31 (13.83%)	09 (4.01%)
December	119	06	5.04%	04 (3.36%)	02 (1.68%)
TOTAL	**1746**	**138**	**7.9%**	**83 (4.75%)**	**55 (3.15%)**

***Numbers of blood slide examined for malaria parasite. **Malaria parasite positive blood slide in patients.**

Table No.2: Age and gender wise distribution of malaria infection

S.No	Age (year)	Male	Female	Total	MP +ve*	P.vivax (%)	P. falciparum (%)
01	Below 10	184	160	344	38	23 (60.6%)	15 (39.4%)
02	11 - 20	332	258	590	43	24 (55.8%)	19 (44.2%)
03	Above 21	444	368	812	57	36 (63.2%)	21(36.8%)
04	**Total**	**960**	**786**	**1746**	**138**	**83 (60.2%)**	**55 (39.8%)**

***Malaria parasite positive blood slide in patients.**

DISCUSSION

Malaria is a major global health problem, occurring in more then100 countries in the world[17,24], affects an estimated 300 million people and causes more than a million deaths per year.[18] Falciparum malaria has high mortality as it causes complication like cerebral malaria, renal failure and algid malaria.[19]

In our study 1746 patients suspected for malaria were screened during January 2011 to December 2012. Out

of 1746 individuals 138 cases were positive for malaria parasite. In positive cases 60.1% were indentified positive with plasmodium vivax and 39.90% with Plasmodium falciparum. Negligible mixed infection of P. falciparum and P. vivax was also observed. Male patients were more affected by plasmodium than female may be due to maximum exposure to vector. Male to female ratio were found in this study was 1.2:1 and mean age was 21 years in patients positive with malaria.

The positivity rate for malaria parasite was found 7.9% (138/1746) in general population. A research work for malaria in 2007 at Ayub teaching hospital Abbottabad shows 7.2% malaria infection in general population.[8] A study about the prevalence of malaria infection in human population in 3 district localities of Quetta, Pakistan confirm finding of our study.[17,18,21] Another study conducted about the prevalence of malaria parasite at Dera Murad Jamali in 2008 find out the malaria parasite 40.4%. P. vivax infection was 71.7% and 28.2% with P. falciparum out of positive cases.[22] Among the positive cases we observed significantly high positivity of P. vivax which was 60.2% (83/138) then P. falciparum (55/138) that only were 39.8%. A study conducted at Karachi and other areas in sindh, Pakistan shows that malaria in patients with P. vivax was 62.5% and patients were positive with P. falciparum were only 36.0%.[13,14] Another study was carry out at Karachi and in others areas of sindh, Pakistan showing the similar results. It shows two time high P. vivax infection then P. falciparum.[15,16] A study in Mansehra in 2006, 160 cases of malaria in children were investigated and results of study were reveals the high vivax infection.[6] Study conducted in 2011 in patients with fever in all provinces of Pakistan including Islamabad. P. vivax ranged from 2.4% to 10.8% and P. falciparum ranged 0.1% to 3.8% which is similar to this study.[22]

This study raises the roof of positivity of P. vivax and P. falciparum in almost all age groups and do not show significant difference. Positive cases of P. Vivax in patients aged below 11 years were 60.6%, from 11 to 20 years were 55.8% while in patients above 20 years were 63.2%. Among P. falciparum positive cases 39.4% were under 11 years, 44.2% were aged from 11 to 20 years while 36.3% were above 20 years.

However in our study seasonal variation also noted. High prevalence of P. vivax malaria infection was found during the month of October and November due to humidity and optimum temperature in our region while lowest infection rate were found in January. Highest infection of P. falciparum found in January and lowest in April. Study conducted at Dera Murad Jamali shows highest infection of P. vivax in October and lowest in January and infection with P. falciparum in January while lowest in October.[23]

CONCLUSION

High slide positivity rate was observed in clinically suspected cases of malaria. Identification of malaria in acute stage are significant for morbidity and mortality. Screening of suspected cases and anti-mosquito eradication measures should be taken for breading sites of vector, mass education and awareness programs may be initiated.

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