

SOME STUDIES ON INCIDENCE OF MALARIA IN SCHOOL GOING CHILDREN OF VILLAGES OF MULTAN DISTRICT (PUNJAB) PAKISTAN.

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خلاصہ

یہ مطالعہ اپریل ۲۰۱۸ء سے ستمبر ۲۰۱۸ء کے دوران ضلع ملتان کے چار دیہاتوں میں پرائمری سکول کے بچوں میں ملیریا کے طفیلیات کے خدشات کے جائزے کے لئے کیا گیا۔ کل ۳۳۳ بلڈ فلمز اکٹھی کی گئیں۔ جس میں سے ۶۰۲ (۰۳.۱۶ فی صد) مثبت پائی گئیں۔ اس شرح میں ۱۰۱ (۰۲.۹۴ فی صد) بچوں اور ۵۰۱ (۸۹.۰۵ فی صد) بچیوں میں ملیریا کے طفیلیات پائے گئے۔ مجموعی طور پر بچوں میں ۲۶.۴۳ فی صد جبکہ بچیوں میں ۰.۶۳ فی صد ملیریا طفیلیات کا مشاہدہ کیا گیا۔ ان میں سے ۲۵.۶۲ فی صد بچوں اور ۳۴.۶۲ فی صد بچیوں کو پلازموڈیم وائی ویکس سے متاثرہ پایا گیا، ۸۲.۷۱ فی صد بچوں اور ۴.۳۲ فی صد بچیوں کو پلازموڈیم ملیری سے متاثرہ پایا گیا۔ ۲۱.۶۹ فی صد بچوں اور ۲۱.۶۰ فی صد بچیوں کو پلازموڈیم فالسی پیرم سے متاثرہ پایا گیا۔ جبکہ ۵.۵۵ فی صد بچوں اور ۵.۹۵ فی صد بچیوں کو پلازموڈیم وائی ویکس، پلازموڈیم ملیری، پلازموڈیم فالسی پیرم، پلازموڈیم اوویل۔

مطلوبہ الفاظ: ملیریا، بچے، پلازموڈیم وائی ویکس، پلازموڈیم ملیری، پلازموڈیم فالسی پیرم، پلازموڈیم اوویل۔

Abstract

A survey of four villages of primary school children of Multan District was made during April 2018 – September 2018 for the incidence of malarial parasites. A total of 336 blood films were collected. Out of which 206 (61.30%) were found to be positive. Out of this ratio, 101 (49.02%) were male and 105 (50.98%) were female with malaria parasites. An overall incidence of malaria parasites in male was 62.34% while in female was 60.34%. Among them 26.54% male and 26.43% female were infected with *Plasmodium vivax*, 17.28% male and 17.24% female were infected with *Plasmodium malariae*, 12.96% male and 12.06% female were infected with *Plasmodium falciparum* while 5.55% male and 4.59% female were infected with *Plasmodium ovale* parasites. The highest and lowest intensities of infections were also recorded among all these malarial parasites.

(Keywords: Children, Malaria, *Plasmodium vivax*, *Plasmodium malariae*, *Plasmodium falciparum*, *Plasmodium ovale*.)

Introduction

Malaria is known as a major parasite disease of public health. Over 215 million malarial cases were reported in 2010. Parasites of the species *Plasmodium falciparum* is the most severe form of malaria. Most severely it is transmitted through the bite of an infected female mosquito Anopheles when it feeds on human beings (WHO, 2012).

Malaria is considered as one of the major poverty related disease, to be eradicated. Children below five years and pregnant women are felt hardest due to consequences of malaria. A child dies from malaria every thirty seconds with the absence of hygiene and proper nutrition (MFI, 2013). Many studies have been conducted to investigate the attitudes, knowledge and practices of people with respect to malaria but only few to know about the malarial cause (Hlongwana *et al.*, 2009; Midzi *et al.*, 2011).

A recent report about malaria from Pakistan, which was published in 2017, evidence sustained decrease in the number of cases, but however we are unable to achieve the target in all over the world about malarial eradication (Khan *et al.*, 2018).

This study was conducted to explore malaria in school children

Materials and Methods

This survey was conducted during April 2014 to September 2014, for malarial incidence in schools of four villages of district Multan; Hamid Pur, Khokharan, Band Bosan and Budhla Sant. Hamid Pur and Khokharan are about 24.5 km and 32.2 km respectively from Multan (a large district with about 2 million inhabitants). Band Bosan is about 25 km from Multan while Budhla Sant is about 15 km from Multan. In these areas, most of the inhabitants are peasants and farmers with low level of primary education.

A total of 336 blood films were collected from the schools of above cited four villages. The children were from classes 2, 4 and 5 of the primary school level education. The age range of the students was from 6 years to 12 years. A printed questionnaire was filled for each student in order to have full information regarding name of the student, father's name, sex age, weight, height, percentage of haemoglobin and previous history of ailment. Using Seca 225 Statometer, the height was obtained while weight was obtained with the help of machine. Temperature of the students was also taken with thermometer. Data was analyzed by using the SPSS software.

Results and Discussion

Overall 336 primary school respondents (children) of four villages took part in this study as shown in table1. About 89.9% parents and guardians of the children were farmers with a low level of primary school education.

Table 1: Gender wise distribution of the respondents (children).

No.	Name of Village	No. of Male	Sex Ratio		
			% of Male	No. of Female	% of Female
1	Hamid Pur	35	10.41	47	13.98
2	Khokharan	22	6.54	25	7.44
3	Band Bosan	38	11.30	42	12.50
4	Budhla Sant	67	19.94	60	17.85
Total		162	48.19	174	51.77

In the six months (from April to September 2018) prior to this study 206 (61.30%) out of 336 of the children both male 101 (49.02%) and female 105 (50.98%) were found to be sick of malaria. This showed that an overall incidence of malarial parasites in male was 62.34% while in female was 60.34% as shown in Table II. The remaining 130 (38.69%) of the children both male and female had been found of other ailment and mostly in combination. Fever, headaches and cough (32.90%, 34.02% and 32.98% respectively) were common in children.

During this field work the dusty nature of the roads was noticed. No toilets and tap water were found in the study areas. 55.60% of the respondents used mostly water from the stream while 25.50% used from the wells. 82.20% of the respondents were self-treated in most cases of the above mentioned disease while 12.50% received treatment from the health center and 10.2% traditional healers.

Out of 336 blood films collected from school children from four villages at district Multan, 206 (61.30%) were found to be positive for malarial parasites (MP). Out of this (206) ratio, male were 101 (49.02%) with malarial parasites (MP) while female were 105 (50.97%) with malarial parasites (MP). Among them 26.54% male while 26.43% female were infected with *Plasmodium vivax*, 17.28% male and 17.24% female were infected with *Plasmodium malariae*. Similarly, 12.96% male and 12.06% female were infected with *Plasmodium falciparum* while 5.55% male and 4.59% female were infected with *Plasmodium ovale*. The highest infection was found to be 71.59% in male and 76.59% in female in schools of Hamid Pur village while the lowest infection was found to be 54.52% in male and 44% in female in schools of Khokharan village. The highest incidence of *Plasmodium vivax* (26.54% in male and 26.43% in female) while the lowest incidence of *Plasmodium ovale* (5.55% in male and 4.59% in female) was found as shown in table II. The highest intensity of infections was found to be with *Plasmodium vivax* 98/10000 R.BCs. with *Plasmodium malariae* 112/10000 R.B.Cs. with *Plasmodium falciparum* 370/10000 R.B.Cs. and 382/10000 with *Plasmodium ovale*. Similarly, the lowest intensity of infection was found to be with *Plasmodium vivax* 22/10000 R.BCs. with *Plasmodium malariae* 25/10000 R.B.Cs. with *Plasmodium falciparum* 27/10000 R.B.Cs. and with *Plasmodium ovale* 42/10000 R.B.Sc. Correlation between *Plasmodium vivax*, *Plasmodium malariae*, *Plasmodium falciparum*, *Plasmodium ovale* and haemoglobin percentage (Hb%) was also determined but no significant correlation was found among them.

Table II: Overall incidence of Malarial parasites in school going children of district Multan (April 2018 to September 2018).

S. No.	Name of Village	Total Slides Positive Samples (TSPS)				Plasmodium P. Vivax				Plasmodium malariae				Plasmodium falciparum				Plasmodium ovale			
		♂	%	♀	%	♂	%	♀	%	♂	%	♀	%	♂	%	♀	%	♂	%	♀	%
1	Hamid Pur	25/35	71.4	36/4	76.5	10/3	28.5	18/4	38.2	5/35	14.2	8/47	17.0	7/35	20.0	6/47	12.7	3/35	8.57	4/47	8.51
			2	7	9	5	7	7	9		8		2		0		6				
2	Khokharan	12/22	54.5	11/2	44.0	5/22	22.7	6/25	24.0	5/22	22.7	4/25	16.0	1/22	4.54	1/25	4.00	1/22	4.54	0/25	0.00
			4	5	0		2		0		2		0								
3	Band Bosan	22/38	57.8	20/4	47.6	8/38	21.0	6/42	14.2	7/38	18.4	6/42	14.2	5/38	13.1	6/42	14.2	2/38	5.26	2/42	4.76
			9	2	1		5		8		2		8		5		8				
4	Budhla Sant	42/67	62.6	38/6	63.3	20/6	29.8	16/6	26.6	11/6	16.4	12/6	20.0	8/60	11.9	8/60	13.3	3/67	4.47	2/60	3.33
			8	0	3	7	5	0	6	7	1	0	0		4		3				
Total		101/16	62.3	105/17	60.3	43/16	26.5	46/17	26.4	28/16	17.2	30/17	17.2	21/17	12.9	21/17	12.0	9/16	5.55	8/17	4.59
			2	4	4	2	4	4	3	2	8	4	4	4	6	4	6		2	4	

Malaria is a worldwide disease. In Pakistan, it is potentially a public health problem. In our society, particularly people living in rural areas, malaria is the major cause of mortality and morbidity. The major cause of this infection are favourable environmental conditions for the unhygienic living conditions, poor sanitation, overcrowding, vector, lack of prophylactic measures and ineffectiveness of the malarial control programmes etc.

The results of this study showed that 206 (61.30%) of the children both males and females were found to be malarial parasites (MP), while others 130 (38.69%) of the children were found to be sick of other ailment and mostly in combination. Some studies in District Mardan reported that the overall incidence of malaria was found to be 6.28% in 1990 and 5.68% in 1991 (MCP, 1990-91). It is slightly lower than the present study. In another study by Hamid and Kaleem (1993), the incidence of malaria in Afghan refugees school going children was found to be 7.92%. According to DMCP, 1990 - 1991, incidence was found to be 6.72% and 5.93% respectively in N.W.F.P. These figures are also less as compared to the present study.

In another study in 33 different schools of Quetta (city) visited showed that *P. vivax* was found to be the most common species with the highest rate of frequency (84.53%) as compared to that of *P. falciparum* (6.02%) in children (Sumbal *et. al.*, 2018). These results are similar with our findings.

In some studies, the highest of infection was found to be 94/10000 R.B.Cs. and lowest intensity was 19/10000 R.B.Cs. with *Plasmodium vivax*. Similarly, highest intensity of infection was found to be 364/10000 R.B.Cs. with *Plasmodium falciparum* (Hamid and Kaleem, 1993). These figures about intensity of highest and lowest categories are also less as compared to this present study.

Conclusion

The results of this study provide baseline knowledge about the prevalence of malaria in school going children and indicate areas which are focus with respect to the knowledge as well as improving the quality of education about various aspects of malaria such as preventive measures which being empowered to maintain their health by using the techniques which they learned about this disease.

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References

- Directorate of Malaria Control, Government of Pakistan (DMCP), (1990-1991). Annual report on Malaria in Pakistan.
- Hamid, A. J. and Kaleem, S. M. (1993). Incidence of Malaria in Afghan Refugees School Going Children of Mardan District (N.W.F.P.) Pakistan. *J. Sc. & Tech. Univ. Peshawar*, Vol. **17**(1) pp.3-4.
- Hlongwana, K. W., Mabaso, M. L. H., Kunene, S., Govender, D. and Maharaj, R. (2009). *Malaria Journal*. **8**:29-2875-8.
- Khan, A. R., Khan, N. and Khan, H. (2018). Frequency of slide positivity in clinically suspected malaria cases. *Gomal Journal of Medical Sciences*. **12**(118-20). Malaria Control Program, Balochistan, Survey Report of 2016-2017, p.1.
- Malaria Control Programme (MCP), (1990-1991). Annual Report on Malaria in N.W.F.P.
- Malaria Foundation International (MFI), (2013). About Malaria. Retrieved from Malaria Foundation International.
- Midzi, N., Mtshali-Zinyowera, S., Mapingure, M. P., Paul, N. H., Sangweme, D., Hlerema, G., Mutasaka, M. J., Tongogara, F., Makware, G., Chadukura, V., Brouwer, K. C., Mutapi, F., Kumar, N. and Mduluza Midzi, T. (2011). *BMC Infectious Disease*. **11**:169.
- Sumbal, A., Iqbal, M.Y., Naseem, M. and Khan, L. (2018). Frequency of *P. vivax* and *P. falciparum* malaria in school going children of Quetta (City), Balochistan, vol.13, No.6, p.43-50.
- Russel, P. F. (1963). *Practical Malariology*. West Reginald. D. Machonald 2nd Ed. Manwell & George, pp.750.
- World Health Organization (WHO), (2012). World Malaria Report 2012. Retrieved from http://www.who.int/malaria/publications/world_malaria_report_2012_full_report.pdf.