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IP International Journal of Medical Paediatrics and Oncology

Journal homepage: www.ipinnovative.com

Original Research Article

To correlate clinical profile & laboratory parameters with final outcome in Plasmodium vivax (Pv) and Plasmodium falciparum (Pf) malaria

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ARTICLE INFO

Article history:
Received 21-08-2020
Accepted 22-08-2020
Available online 29-09-2020

Keywords:
Clinical
Plasmodium Vivax
Plasmodium Falciparum
Malaria

ABSTRACT

Materials and Methods : A total of 230 confirmed cases of malaria were taken up for the study from the admitted patients in MGM Medical College & M. Y. Hospital, of which 141 were falciparum positive, 69 were vivax positive & 20 patients were positive for both Pf & Pv.

Result: Comparison of duration of stay in Plasmodium falciparum and Plasmodium vivax malaria P value < 0.001 highly significant; <0.05 significant; >0.05 not significant, Comparison of hematological parameters in Plasmodium falciparum and Plasmodium vivax malaria P value < 0.001 highly significant; < 0.05 significant; > 0.05 not significant.

Conclusion: Cerebral malaria is the most lethal entity of severe malaria and children are more prone than other susceptible groups. Encephalopathy, shock and renal failure at the time of presentation were poor prognostic factors, while anemia and thrombocytopenia were not found to be associated with adverse outcome.

Thrombocytopenia is a key indicator of malaria infebrile patients. Nature of thrombocytopenia in malaria is benign, mostly recovering with antimalarials without platelet transfusions. In our study, mortality rate of malaria was found to be 4.7%. Pf was associated with higher mortality rate as compared to Pv. Complications were more common with Pf group, though they were also seen in Pv group.

1. Introduction

Malaria is transmitted exclusively through the bites of Anopheles mosquitoes. The intensity of transmission depends on factors related to the parasite, the vector, the human host and the environment.[1]

About 20 different Anopheles species are locally important around the world. All of the important vector species bite at night. Anopheles mosquitoes breed in water and each species has its own breeding preference; for example some prefer shallow collections of fresh water, such as puddles, rice fields and hoof prints.[2] Transmission is more intense in places where the mosquito lifespan is longer (so that the parasite has time to complete its development inside the mosquito) and where it prefers to bite humans rather than other animals. For example, the long lifespan and strong human-biting habit of the African vector species is the main reason why more than 90% of the world's malaria deaths are in Africa.[3]

Transmission also depends on climatic conditions that may affect the number and survival of mosquitoes, such as rainfall patterns, temperature and humidity. In many places, transmission is seasonal, with the peak during and just after the rainy season. Malaria epidemics can occur when the climate and other conditions suddenly favour transmission in areas where people have little or no immunity to malaria. They can also occur when people with low immunity move into areas with intense malaria transmission, for instance to find work or as refugees.[4]

There is also wide variability of malaria profile among different geographic regions. Therefore, our study was planned to look for clinical profile & lab parameters of Plasmodium falciparum & Plasmodium vivax malaria and contribution to morbidity & mortality in children in our

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https://doi.org/10.18231/j.ijmpo.2020.027

Table 1: Age and sex distribution in plasmodium species

Total no. of patients	**230**
Male	129 (56.1%)
Female	101 (43.9%)
M:F	1.277
Total no. of Pf	141 (61.3%)
Male	76 (53.9%)
Female	65 (46.1%)
M:F	1.17
Total no. of Pv	69 (30%)
Male	42 (60.8%)
Female	27 (39.1%)
M:F	1.55
Total no. of mix cases	20 (8.7%)
Male	11 (55%)
Female	9 (45%)
M:F	1.22

Table 2: Comparison of duration of stay in Plasmodium falciparum and Plasmodium vivax malaria

	P. falciparum		**P. vivax**		**Mix**		
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**	**p value**
Duration of hospitalization	5.26	2.41	4.88	1.97	5.55	2.46	0.405

Value < 0 001 highly significant; <0 05 significant; >0 05 not significant

Table 3: Comparison of hematological parameters in Plasmodium falciparum and Plasmodium vivax malaria.

Hematological Parameters	**P. falciparum**			**P.vivax**			**P value**
	N	**Mean**	**SD**	**N**	**Mean**	**SD**	
Hb	14 1	6.25	2.52	6 9	7.68	2.62	0.001
TLC	14 1	10,705	7,065	6 9	8,892	6269	.082
Platelet	14 1	1,37,99 2	1,42,71 3	6 9	1,63,83 5	1,32,29 5	.201

Value < 0 001 highly significant; < 0 05 significant; > 0 05 not significant

hospital which is a tertiary care government hospital in central India.[5]

2. Materials and Methods

A total of 230 confirmed cases of malaria were taken up for the study from the admitted patients in MGM Medical College & M. Y. Hospital and CNBC over 2 years from Oct 2010 to Sep 2012, of which 141 were falciparum positive, 69 were vivax positive & 20 patients were positive for both Pf & Pv.

2.1. Inclusion criteria

1. Children <14 years of age with fever admitted to M.Y. Hospital & Chacha Nehru Bal Chikitsalaya Avum Anusandhan Kendra, who were tested positive for plasmodium vivax/falciparum.
2. Presence of malarial parasite on thick and thin peripheral smear and/or positive rapid malaria antigen test (rapid immono-chromatogenic test) was considered as diagnostic for malaria.
3. RDT was performed according to the manufacturer's instructions.
4. Categorization into severe malaria and their treatment was as per
5. WHO guidelines.[6] Admission laboratory values were used for patient classification and data analysis.
6. Parental consent was not taken, because the study was done following standard hospital practice without introduction of any experimental procedures.

2.2. Exclusion criteria

1. All patients were investigated for other co-existent infections including enteric fever, dengue and hepatitis, whenever deemed relevant. Patients having another infection with plasmodium such as enteric fever and hepatitis were excluded.

2. Patients affected with chronic hemolytic anemia & chronic liver disease were excluded.

3. Results and Discussion

This is in line with the conclusion of UM Jadhav et al[7] that presence of thrombocytopenia is not a distinguishing feature between vivax and falciparum malaria. Profound thrombocytopenia is a well-recognized complication of Pf malaria but has been less well described in Pv malaria. A recent study from Venezuela by Rodrıguez-Morales AJ, Sanchez E, Vargas M, et al[8] reported thrombocytopenia in 58.9% cases with Pv malaria. Another series on adult patients with Pv monoinfection by Kochar DK[6] reported severe thrombocytopenia in 12.5% cases. Krishnan, Anand MD, Dilip R MD et al[9] in 2003 reported thrombocytopenia in 40% patients diagnosed with malaria. Sharma SK et al[10] in their study of 30 cases of falciparum malaria concluded that 90% of the cases had thrombocytopenia. The high prevalence of thrombocytopenia observed in malaria patients establishes thrombocytopenia as a key indicator of malaria in febrile patients, Laura M Erhart, Kritsanai Y, Niphan C, Buathong et al[11] in 2004 concluded in their study that patients with platelet count less than 1.5 lakh were 12-15 times more likely to had malaria.

4. Conclusion

Cerebral malaria is the most lethal entity of severe malaria and children are more prone than other susceptible groups. Encephalopathy, shock and renal failure at the time of presentation were poor prognostic factors, while anemia and thrombocytopenia were not found to be associated with adverse outcome.

Thrombocytopenia is a key indicator of malaria infebrile patients. Nature of thrombocytopenia in malaria is benign, mostly recovering with antimalarials without platelet transfusions. In our study, mortality rate of malaria was found to be 4.7%. Pf was associated with higher mortality rate as compared to Pv. Complications were more common with Pf group, though they were also seen in Pv group.

5. Source of Funding

None.

6. Conflict of Interest

None.

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Cite this article: Goyal P, Choudhary PK. **To correlate clinical profile & laboratory parameters with final outcome in Plasmodium vivax (Pv) and Plasmodium falciparum (Pf) malaria** . *IP Int J Med Paediatr Oncol* 2020;6(3):118-120.