CORRELATION OF MALARIA POSITIVE CASES WITH REFERENCE TO PLATELET COUNT AMONG PATIENTS ATTENDING TMMC&RC, MORADABAD, (U.P)

Rajesh Kumar — Jr3 Department of Microbiology, Department of Microbiology, Teerthanker Mahaveer Medical College & Research Center, Moradabad, (TMMC&RC) Uttar Pradesh, India.

Umar Farooq — Prof & H.O.D. of Microbiology, Department of Microbiology, Teerthanker Mahaveer Medical College & Research Center, Moradabad, (TMMC&RC) Uttar Pradesh, India.

Sudhir Singh — Assistant professor of Microbiology, Department of Microbiology, Teerthanker Mahaveer Medical College & Research Center, Moradabad, (TMMC&RC) Uttar Pradesh, India.

Shivendra Mohan — Ph.D. Scholar; Department of Microbiology, Department of Microbiology, Teerthanker Mahaveer Medical College & Research Center, Moradabad, (TMMC&RC) Uttar Pradesh, India.

Divya Chaubey — Department of Microbiology, Department of Microbiology, Teerthanker Mahaveer Medical College & Research Center, Moradabad, (TMMC&RC) Uttar Pradesh, India.

Imran Ahamad — Jr2 Department of Microbiology, Teerthanker Mahaveer Medical College & Research Center, Moradabad, (TMMC&RC) Uttar Pradesh, India.

ABSTRACT

Introduction: Malaria is one of the major health problems in tropics with increased morbidity and mortality. Mortality rate is generally high in severe malaria whereas haematological changes are most common presentation of malaria.

Objective: Detection of malaria positive cases and their correlation with platelet count.

Material & Methods: Total 200 patients are included in the study from April 2016 to March 2017. Subjects were identified positive for malaria parasite by using peripheral blood smear examination. Platelet count was done on a fully automated quantitative analyzer.

Result: Out of 200, 62(31%) were positive for malaria. Male (64 %) were more affected then female. Thrombocytopenia was more commonly seen in P. vivax and P. falciparum.

Conclusion: Thrombocytopenia is a common occurrence in P. vivax and P. falciparum and in mixed infections. Early diagnosis and treatment reduces the global burden of malaria.

KEYWORDS

Malaria, Platelet count

*Corresponding Author Dr. Rajesh Kumar

Department of Microbiology, Department of Microbiology, Teerthanker Mahaveer Medical College & Research Center, Moradabad, (TMMC&RC) Uttar Pradesh, India. dr.rajeshpriyadarshi@gmail.com

Introduction:

Malaria is a protozoal disease caused by plasmodium. It remains one of the major problems regarding health in tropics with increased morbidity and mortality. Mortality rate is usually high in falciparum malaria and the most common hematological changes occurring in malaria is thrombocytopenia. (1)Thrombocytopenia may be associated with bleeding tendency which is one of the severe manifestations of P. falciparum malaria. Mechanisms leading to thrombocytopenia are immune mechanisms, oxidative stress, antibody mediated platelet destruction splenomegaly and direct counter action between plasmodium and platelets. (2) Thrombocytopenia in acute febrile travelers has become a highly sensitive clinical marker for malaria diagnosis. (3) A typical attack of malaria comprises three distinct stages: cold stage, hot stage and sweating stage 4. It is a disease of tropical and subtropical countries particularly Africa and Asia. Africa accounts for 90% of mortality whereas South-east Asia also suffers considerable mortality and morbidity5. Clinical presentation of malaria includes fever with chill & rigors, sweating, vomiting, headache, abdominal pain, hepatomegaly and splenomegaly. Various hematological have been reported in malaria like neutropenia, lymphopenia and thrombocytopenia. Among these thrombocytopenia is most common complication recognized for both species of malaria like P. falciparum and P. vivax. The clinical diagnosis of malaria is challenging as signs and symptoms overlap with other febrile illness. The Gold standard for diagnosis is smear positivity 6. Early diagnosis remains the key to the effective management of malaria. Smear positivity is informative and inexpensive but it requires expertise and repeated smear examinations. Polymerase chain reaction (PCR) is most sensitive method but it cannot be used for routine purpose. Malarial antigen based rapid diagnostic tests are a valid alternative to microscopy but they are expensive than microscopy but cheaper to PCR. That's why it is commonly used 7. The average annual case load around two million in late nineties and shows decline trend since 2002. Malaria cases have gradually declined from 2.08 to 1.06 million during 2001 to 2012. The slide positivity rate has also shown gradual decline from 3.5 in 1995 to 0.98 in 2012. Reported plasmodium falciparum cases have declined from 1.14 million in 1995 to 0.53 million cases in 2012. However, the percentage of plasmodium falciparum infections has gradually increased from 39% in 1995 to 50.01% in 2012 8. Clinical features of malaria vary from mild to severe and complicated according to the species of parasite present, patient's state of immunity, intensity of infections and also the physical conditions such as malnutrition and other diseases. Malaria parasites affects multiple organs of the body

like liver, spleen, brain, gastrointestinal tract, gall bladder, pancreas, blood vessels and placenta. Clinical picture could be of wide spectrum ranging from simple malaise to life threatening C.N.S. symptoms like coma 9.

Material and Methods:
Total 62 patients were diagnosed to have malaria admitted at medicine wards in the department of medicine, Teerthanker Mahaveer Medical College & Research center, Moradabad from April 2016 to March 2017 included in our study. This is a prospective study which satisfying inclusion and exclusion criteria.

All study subjects were identified malaria positive by peripheral smear examination with conventional microscopy and by rapid diagnostic test (MAL CARD by J. Mitra). Venous blood samples were collected in EDTA vacutainers and Platelet count was done by a fully automated quantitative analyzer (SYSMEX XS – 800 i) and it was counter checked manually by microscopic examination of thin blood smear.

Platelet count was the number of thrombocytes derived from directly measured platelet pulse, multiplied by a calibration constant and expressed in thousands of thrombocytes per microliter of whole blood. Repeat platelets count were done on daily basis to observe changes in count from admission. Very low platelet counts were re-examined by manual method.

Thrombocytopenia were categorized in three parts on the basis of platelet count, these are Mild thrombocytopenia (platelet count from 50,000 to less than 1,50,000 cells/ μl), Moderate thrombocytopenia (platelet counts 20,000 to less than 50,000 cells/μl and Severe thrombocytopenia (platelet counts less than 20,000 cells/μl).

A written informed consent was taken from each and every case that was included in my study after through proper counseling. Following investigation was done like complete blood picture, thick and thin blood smear for malaria parasite & parasite count, specific malarial antigen test, dengue serology, random blood sugar, liver function test etc.

Result:
Out of 200 total cases, 62 (31%) were malaria positive. (Fig.1). Among all malaria positive cases, their species distribution are P. vivax 51 (82.25%). P. falciparum 9 (14.51%) and mixed infection 2 (3.22%). (Fig.2) Males were predominantly affected 40 (64.51%) then female 22 (34.37%) (n= 62). (Fig.3) Maximum positive cases 23 (37.09%) were seen between 21-30 years of age (n= 62) (Fig.4) Out of 62 positive cases, 56 (90.32%) patient had thrombocytopenia. Moderate to severe thrombocytopenia were seen in total 17 cases. (n= 62) (Fig.5).

Discussion:
This was a prospective study including 200 cases, attending medicine OPD and IPD at TMMC&RC, MORADABAD U.P. The results obtained were discussed below:-

In our study, 38% cases were seen between the age group of 21 to 30 years which was similar to the study done by Mohd Arif et al (38%) Severe thrombocytopenia is more associated with P. falciparum (13%) as compared to P. vivax (9%) infection.Platelet count < 20,000 was seen in P. falciparum and P.vivax both but more commonly in P. falciparum malaria 10.Males (64%) were more affected than female in this study and it is similar to the study done by Ifeanyichukwu M.O and Esan A.J.Thrombocytopenia are occurring in 56% of patients in this study which is similar to the study done by Shiraz Jamal khan, Yasir Abbass and Mumtaz Ali Marwat. Here, thrombocytopenia is 53% which is very close to our study 12.

The above finding can have therapeutic implication in context of avoiding unnecessary platelet transfusion because platelet count improved spontaneously with anti-malarial treatment.

Conclusion:
Thrombocytopenia is a common occurrence in P. falciparum , P. vivax and in mixed infections. Early diagnosis and treatment reduces the global burden of malaria. Outcome of complicated malaria is better predicted by the severity of thrombocytopenia but it does not help in early diagnosis. Unnecessary platelets transfusion is not required for mild to moderate degree of thrombocytopenia in malaria patients to
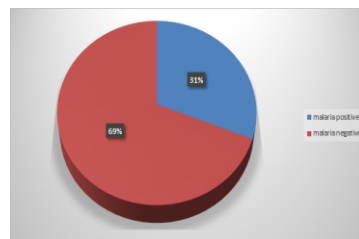
cut short cost burden in poor patients.

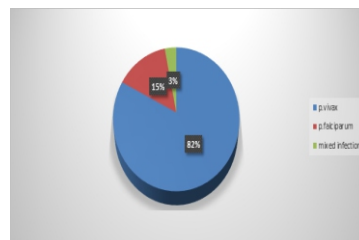**Fig.1:- Distribution Pattern of Malaria Positive and Negative Cases**

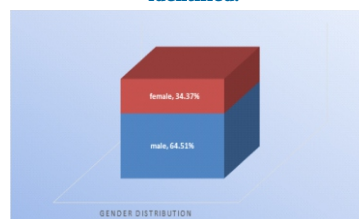**Fig.2:- Percentage wise Distribution of Plasmodium species identified.**

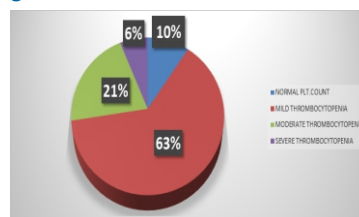**Fig.3:- Sex wise distribution of Malaria Cases.**

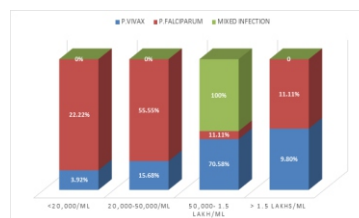**Fig.4:- Percentage of Thrombocytopenia among Malaria Positive Cases.**

Fig.5:- Graph showing correlation of different Plasmodium spp with platelet Count.

References:
1. Kumar R, Giri R, Singh N. et al; A Study on Clinical Presentation and Outcome of Malaria from an Underreported P. vivax from predominant Region of North India. Sch. J. App. Med. Sci., 2016; 4(1C):233-243.
2. Kumar J, Kumar A, Vandana et al., Thrombocytopenia as a Marker for Diagnosis of Malaria. J Den. Med. Sci.2014; 13 (9):36-38.
3. Lacerda G. V. M, Mourao G. P. M, Coelho C. C. H et al; Thrombocytopenia in malaria: who cares? Mem Inst Oswaldo Cruz, Rio de Janeiro, 2011; 106(Suppl. 1):52-63.
4. K Park, Park's textbook of Preventive and Social Medicine: 19th edition.
5. Sumathi S. Correlation of hematological parameters in Malaria positive cases – A retrospective study in rural Melmaruvathur, South India. Int J Med Microbiol Trop Dis. 2016;2(2):48-51.
6. Singh P. L, Nema K.S, Narang S. et al; Diagnostic significance of thrombocytopenia in malaria and its correlation with type and

severity of malaria. Ind J Pathol and Onco. 2016; 3(2):194-196.

7. Gill K. M, Makkar M, Bhat S. et al; Thrombocytopenia in malaria and its correlation with different types of malaria. 2013; 6 (2):197-200.

8. Nayer S. Reddy M. M. Vijayshree R. et al; Haematological Parameters Including Platelet Indices in Vivax and Falciparum Malaria. Chettined Health City Med J 2014; 3(3):95-100.

9. Gupta K. N, Bansal B. S. Jain C.U. et al; Study of thrombocytopenia in patients of malaria. Trop Parasitol. 2013; 3(1):58-61.

10. Arif M, Jelia S. Meena R.S. et al; A study of thrombocytopenia in malaria and its prognostic significance. Int J Res Med Sci 2016; 4 (6):2373-78.

11. Ifeanyichukwu M.O, Esan A. J. Evaluation of Blood cells and platelets Plasmodium falciparum Malaria Infected Individuals. Int J Hematol Dis.2014; 1(1): 49-54.

12. Khan J. S. Abbas Y. Marawat A.M. Thrombocytopenia as an indicator of Malaria in Adult population. Hindawi Publication 2012 Article I.D. 405981.