Evaluation of etiological differences in thrombocytopenia in underdeveloped country.

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Abstract:*The etiologies of thrombocytopenia are diverse. The most common causes of thrombocytopenia are idiopathic (immune) thrombocytopenia purpura, leukemia, aplastic anemia, bone marrow infiltration, hypersplenism, disseminated lupus erythematosus. However in hospital where this study was done it was noted that microbiological causes were found in majority of thrombocytopenia cases. Prospective analysis of all thrombocytopenic blood samples received in clinical pathology laboratory from various departments of Sir Takhtasinhji Hospital, Bhavnagar was carried out during the period from 1st October to 30th November 2014. Most common cause of thrombocytopenia was malaria (21.2%) followed by viral fever (14.8%) and dengue fever (10.4%). Cirrhosis comprised 8.8%, neonatal septicemia 7.2%, gestational thrombocytopenia 5.6%. Other causes were iron deficiency anemia 5.6%, preterm neonate 4.4%, megaloblastic anemia 3.6%, pneumonia 2.8%. ITP comprised 1.6%, DIC 0.8%, and acute myeloid leukemia & chronic lymphoid leukemia comprised 0.4%.Malaria was the leading cause of thrombocytopenia in this study followed by nondengue viral fever & dengue fever closely followed by cirrhosis & neonatal septicemia. These are different from the etiologies reported. These etiological differences are of important in assessment and management of thrombocytopenia in this region of the world.*
Key words:*Thrombocytopenia, Malaria, Viral fever, Dengue, Neonatal septicemia, Gestational thrombocytopenia.*

I.   Introduction:

The etiology of thrombocytopenia varies widely ranging from transient marrow suppression to haematological malignancies. The most common causes of thrombocytopenia are idiopathic (immune) thrombocytopenia purpura, leukemia, aplastic anemia, bone marrow infiltration, hypersplenism, disseminated lupus erythematosus, drugs and chemicals. The lesser common causes are infection including HIV, megaloblastic anemia, liver disease, alcoholism, massive blood transfusion, disseminated intravascular coagulation. The rare causes are thrombotic thrombocytopenic purpura, post-partum thrombocytopenia, post-transfusion thrombocytopenia, hemangiomas, food allergy and idiopathic cryoglobulinaemia.[1] However in hospital where this study was done it was noted that microbiological causes were found in majority of thrombocytopenia cases. Knowing the exact etiology is important for specific treatment. Hence blood samples received for CBC examination and found to have thrombocytopenia were analyzed for etiology of thrombocytopenia in consecutive 250 cases.

II.   Material& Methods:

Prospective analysis of all thrombocytopenic blood samples received in clinical pathology laboratory from various departments of Sir Takhtasinhji Hospital, Bhavnagar was carried out during the period from 1st October to 30th November 2014. 250 cases of thrombocytopenia were detected and were categorized into various etiologies taking into account the result of test for malarial parasite, NS1 antigen, biochemical liver parameters, and coagulation parameters were noted. The percentage of various cause detected were grouped into common causes if they were found to occur in more than 10% cases, less common if they were 1-9.99% and rare causes if they found to occur in less than 1%.Pseudothrombocytopenia was excluded by direct peripheral smear examination.

III. Result

Table:1 Thrombocytopenia in different ages & sexes

Age group in years	Male(%)	Female(%)	Total(%)
Neonate	15	11.1	13.6
1-10	4.3	12.2	7.2
11-20	8.1	4.4	6.8
21-30	18.7	35.5	24.8
31-40	24.3	16.6	21.6
41-50	14.3	14.4	14.4
51-60	13.7	3.3	10
61-70	1.2	1.1	1.2
71-80	0	0	0
81-90	0	1.1	0.4

Among males maximum number of patients were in 31-40 years of age group accounting for 24.37%. Most common etiologies in this age group was malaria followed by viral fever, cirrhosis, & dengue fever (Nonviral). **Among females** maximum number of patients were 21-30 years of age group accounted for 35.5%. The most common etiologies in this age group were gestational thrombocytopenia followed by malaria, viral fever & dengue fever(Nonviral).

Female in the age group of 1-10 years were three times more commonly affected compared to males. And males in age group of 11-20 were two times more affected than females. Females in the age group of 21-30 years were more affected due to gestational thrombocytopenia.

Most common cause of thrombocytopenia was malaria (21.2%) followed by viral fever (14.8%) and dengue fever (10.4%). Cirrhosis comprise of 8.8%, neonatal septicemia 7.2%, gestational thrombocytopenia 5.6%, iron deficiency anemia 5.6%, preterm neonate 4.4%, megaloblastic anemia 3.6%, pneumonia 2.8%, ITP 1.6%, DIC 0.8%, while acute myeloid leukemia & chronic lymphoid leukemia comprise of 0.4%. (Table 1)

Table 2: Etiology of thrombocytopenia

More common causes	Less common causes	Rare causes
Malaria(21.2%)	Cirrhosis of liver(8.8%)	DIC(0.8%)
Viral fever(14.8%)	Neonatal septicemia(7.2%)	Acute myeloid leukemia(0.4%)
Dengue fever(10.4%)	Gestational TP(5.6%)	Chronic lymphocytic leukemia(0.4%)
	Iron deficiency anaemia(5.6%)	Sickle cell disease(0.4%)
	Preterm neonate(4.4%)	Aplastic anaemia(0.4%)
	Megaloblastic anaemia(3.6%)	
	Pneumonia(2.8%)	
	ITP(1.6%)	

IV. Discussion:

Table: 3 Comparision of etiology of thrombocytopenia.

Etiology	Present study (n=250)	Bhalra SK et al[2]	Shrivani N et al[3]
	%	%	%
Malaria	21.2	22.8	--
Viral fever(Non dengue)	14.8	-	11.0
Dengue fever	10.4	28.6	-
Cirrhosis of liver	8.8	15.2	-
Neonatal septicemia	7.2	-	-
Gestational TP	5.6	5.5	-
Iron deficiency A.	5.6	-	-
Preterm neonate	4.4	-	-
Megaloblastic A.	3.6	1.9	46.0
Pneumonia/Sepsis	2.8	6.3	3.0

ITP	1.6	3.1	20.0
DIC	0.8	-	-
AML + CLL	0.8	0.7	9.6
Sickle cell disease	0.4	-	-
Aplastic anaemia	0.4	0.4	3.6
Hypersplenism	-	6.3	2.3
Drug indused	-	1.2	3.0
HIV	-	1.4	
Multiple myeloma	-	-	0.6
Myelofibrosis	-	-	0.3
CDA	-	-	0.3
Gelatinous transformation	-	-	0.3
Others	11.6	-	-

The most common cause of thrombocytopenia in this study was malaria (21.2%) followed by viral fever (14.8%). In study conducted by Bhalra SK et al dengue(28.6%) was the most common cause followed by malaria(2.8%) while in study conducted by Shrivani N et al megaloblastic anemia(46.0%) was the most common cause followed by ITP(20.0%) **Alam et al[4]** have reported malaria (43.2%)&**Ross C et al[5]** anemia(38.2%) as the most common cause of thrombocytopenia.

Thrombocytopenia is the most common hematological change in malaria. Both immunological as well as nonimmunological destruction of platelets have been implicated, but the mechanism involved are not completely clear. Immune mediated lysis, sequestration in the spleen and a dyspoitic process in the marrow with diminished platelet production have all been postulated in the cause for thrombocytopenia[6].

In study of Shrivani N. et al the most common non-malignant conditions causing thrombocytopenia were megaloblastic anaemia, post-infectious thrombocytopenia, immune thrombocytopenia, and aplastic anaemia.

The second most common cause of thrombocytopenia in our study was one associated with viral infections. Thrombocytopenia is associated frequently with viral infections[7]. The mechanism of thrombocytopenia in viral infections is immune-mediated platelet destruction with or without megakaryocyte damage or alternatively direct toxicity to megakaryocytes resulting from viral infection of these cells[8]. Megakaryocytes containing inclusion bodies are seen in varicella, cytomegalovirus, infectious mononucleosis, chicken pox, dengue, hepatitis and other parvovirus infections[9].

In a study conducted by Mehmet Ali Erkurtet al[10] in turkey, etiological evaluation of thrombocytopenia, leukemias, infection and ITP represented most of the cases. But in our study, malaria was the main etiological factor causing thrombocytopenia possibly due to low socioeconomic condition of majority of population in India.

V. Conclusion

Malaria was the leading cause of thrombocytopenia in this study followed by non dengue viral fever & dengue fever closely followed by cirrhosis & neonatal septicemia. These are different from the etiologies reported. These etiological differences are of important in assessment and management of thrombocytopenia in this region of the world.

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