International Journal of Contemporary Pediatrics
Pinnamaneni P et al. Int J Contemp Pediatr. 2020 May;7(5):972-979
http://www.ijpediatrics.com
pISSN 2349-3283 | eISSN 2349-3291

DOI: http://dx.doi.org/10.18203/2349-3291.ijcp20201491

Original Research Article

Clinical epidemiology of paediatric febrile and afebrile in-patients and their association with thrombocytopenia

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Received: 25 February 2020
Accepted: 20 March 2020

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ABSTRACT

Background: Fever is one of the commonest and thrombocytopenia is one of the common clinical problems in children. The current study was done with the aim to identify the frequency and the etiology of thrombocytopenia in febrile children. This study was planned to identify epidemiological observations associated with pediatric fever and with febrile thrombocytopenia children, in this area among hospitalized children.
Methods: A sample of 530 children of age 6 months to 18 years were studied. Febrile children were taken as cases (n=268) and afebrile children as controls (n=262). Demographic, clinical and laboratory characteristics were measured and compared between the cases and controls.
Results: Significant proportion of 1-3 years age group of children belong to febrile group compared to afebrile group. There is no significant difference in the gender, region, WFH or BMI, WFA, HFA between febrile and afebrile children. No significant difference in pulse rate, respiratory rate; TLC, ALC, ANC, Hb; Widal test or CRP was noted between pyrexial and apyrexial children. The median platelet count, in the pyrexial group is significantly lower than that of apyrexial group. Prevalence of thrombocytopenia in pyrexial group is significantly more than that observed in apyrexial group. The commonest illness in pyrexial group is non-bacterial-probable viral illness (59.7%). In the apyrexial group the common diseases are neurological (36.6%) disorders.
Conclusions: Prevalence of thrombocytopenia is 11.45% in febrile children and in afebrile children it is 2.38%. In this study, viral infections and neurological disorders are the commonest etiology in febrile group and afebrile children respectively.

Keywords: Children, Febrile patients, Thrombocytopenia

INTRODUCTION

Fever in children is one of the most common manifestations of an illness. Fever occurs when various infectious and non-infectious processes interact with the host's defense mechanism.[1] A fever is a rise in body temperature that goes above a normal level (rectal temperature ≥38°C (100.4°F) or armpit temperature above 37.2ºC (99ºF).[2,3] Armpit temperature is easier to measure than rectal or oral temperatures in children.[3]

Thrombocytopenia refers to a reduction in platelet count to <150×109/l. Causes of thrombocytopenia include decreased production on either a congenital or an acquired basis, sequestration of the platelets within an enlarged spleen or other organ, and increased destruction of normally synthesized platelets on either an immune or a nonimmune basis.[4]

Thrombocytopenia is the most common cause of bleeding in children. Affected children may experience petechiae, epistaxis, gum bleedings, haematuria or gastrointestinal

hemorrhage.[5] Fever with thrombocytopenia is the common problem encountered in Pediatric practice. Infections are found to be the most common cause of fever with thrombocytopenia. In our country clinical epidemiology of fever with thrombocytopenia is available to a limited extent. Such information helps a paediatrician plan management of such children.

Very few authors reported comprehensive epidemiological information of fever associated with thrombocytopenia.[6] Many give information about a single or a few diseases associated with fever and thrombocytopenia.[7,8] Both the common causes of fever and causes associated with change in thrombocyte count vary from study to study indicating temporal and geographical factors for such variability.

The study was done with the objectives to delineate the prevalence of thrombocytopenia in hospitalized febrile children, aged 6 months to 18 years; to identify etiology of fever associated with thrombocytopenia and its difference from afebrile hospitalized children.

METHODS

This was a cross sectional study of a sample of 530 inpatient children in the pediatric department of a rural teaching medical college hospital, Dr Pinnamaneni Siddhartha Institute of Medical Sciences and Research Centre Chinaoutapalli with ages between 6 months to 18 years during the period October 2013 to September 2015. Before starting the study, the approval of institutional ethics committee was obtained. Informed consent was taken from all the patients or from their parents.

A total of 268 patients with fever were considered as cases and 262 patients without fever were considered as controls. Those who were critically ill were excluded.

Demographic data and clinical characteristics of all the patients were collected in predesigned proforma. Laboratory parameters such as complete haemogram including platelet count, blood and urine culture and sensitivity, peripheral smear test and RDT for malaria, Widal test, RDT (antigen antibody test) for dengue, C-reactive protein quantification were done for both cases and controls as per clinical indications.

The collected data was entered into a database, Microsoft excel 2007. Statistical analysis was done using Epi InfoTM 7.1.5.2 of centre for disease control, USA and Medcalc1 5.11.4, Belgium. A test statistic was considered significant if the resulting p value is <0.05.

RESULTS

Demographic data of the patients in both groups was given in Table 1. In the pyrexia group, children between 1-3 years of age (68%) are significantly more compared to apyrexial group (32%). In all other age groups, there is no significant difference in the proportion of children between febrile and afebrile groups. There is no significant difference between boys and girls between pyrexia and apyrexia groups nor within the same groups. There is no sex predilection for the pyrexial illness. Majority of the children in both pyrexia and apyrexia groups were from rural areas and there is no significant difference in the region or domicile of the child between the two groups.

Table 1: Demographic data of the patients in both cases and control groups.

Characteristic	Cases-febrile (n=268)			Controls-afebrile (n=261)		
	Frequency (% of row)	95%	CI	Frequency (% of row)	95%	CI
Age groups in years						
<1 (infant)	30 (63.8)	48.5	77.3	17 (36.2)	22.7	51.5
1-3 (toddler)	70 (68)	58.0	77.0	33 (32)	23.2	42.0
4-6 (pre-school)	55 (47.8)	38.4	57.3	60 (52.2)	42.7	61.6
7-9 (primary school)	39 (42.9)	32.5	53.7	52 (57.1)	46.3	67.5
10-12 (preteen or preadolescence)	42 (46.7)	36.07	57.49	48 (53.3)	42.5	63.9
13-15 (early-adolescence)	30 (39)	28.05	50.75	47 (61)	49.3	72.0
16-18 (late adolescence)	2 (33.3)	4.33	77.72	4 (66.7)	22.3	95.7
Gender						
Female	129	48.13	42.0-54.3	121	46.2	40.0-52.4
Male	139	51.87	45.7-58.0	141	53.8	47.6-60.0
Region						
Rural	258	96.27	93.3-8.2	243	92.75	88.9-95.6
Urban	10	03.73	1.8-6.8	17	06.49	3.8-10.2
Tribal	0	-	-	2	00.76	0.1-2.7

Table 2: Anthropometric data of the patients in both cases and control groups.

Characteristic		Cases-febrile (n=268)			Controls-afebrile (n=261)		
		Frequency	Percentage	95% C.I	Frequency	Percentage	95% C.I
WFH category (children <5 years)	Normal	97	68.79	60.4-76.3	57	63.33	52.5-73.3
	Obese	1	0.71	0.1-3.9	1	1.11	0.03-6.1
	Overweight	-	-	-	1	1.11	0.03-6.1
	Possible risk of overweight	3	2.13	0.4-6.1	6	6.67	2.5-13.9
	Severely Wasted	20	14.18	8.9-21.1	12	13.34	7.1-22.1
	Wasted	20	14.18	8.9-21.1	13	14.44	7.9-23.4
BMI category (children ≥5 years)	Normal	172	64.18	58.1 -69.9	168	64.12	58.0-69.9
	Obese	2	0.75	0.1 -2.7	4	1.53	0.4-3.9
	Overweight	1	0.37	0.01 -2.1	8	3.05	1.3-5.9
	Possible risk of overweight	7	2.61	1.1 -5.3	16	6.11	3.5-9.7
	Severely Wasted	41	15.30	11.2 -20.2	32	12.21	8.5-16.8
	Wasted	45	16.79	12.5 -21.8	34	12.98	9.2-17.7
Height category	Normal	177	66.04	60.0-71.7	163	62.21	56.0-68.1
	Severely stunted	38	14.18	10.2-18.9	37	14.12	10.1-18.9
	Stunted	51	19.03	14.5 -24.2	61	23.28	18.3-28.9
	Very Tall	2	0.75	0.1 -2.7	1	0.38	0.1-2.1

Table 3: WBC parameters in cases and controls.

		Age groups in years						
Characteristic	Group	<1	1 to <2	2 to <4	4 to <6	6 to <8	8 to <10	10 to <16
		(N) Mean±SD						
Total leukocyte count (cells/mm^3)	Case	(24) 12475±3950	(40) 11789 (Geometric)	(41) 11771 (Geometric)	(37) 10135 (Geometric)	(27) 8910 (Geometric)	(30) 7842 Geometric)	(65) 6956 (Geometric)
	Control	(12) 13783±4550	(14) 10021±4787	(32) 11006±3572	(37) 9402 (Geometric)	(33) 9409±2076	(32) 9834±3013	(88) 8381 Geometric)
	Statistics	T-statistic: 0.891; DF: 34	T-statistic: -1.707; DF: 52	T-statistic: -1.699; DF: 68.4	T-statisti: -0.728; DF: 72	T-statistic: -0.511; DF: 33.4	T-statistic: 1.374; DF: 60	T-statistic: 2.620; DF: 118.5
	P value	0.379	0.094	0.094	0.469	0.612	0.174	0.009
Absolute lymphocyte count (cells/mm^3)	Case	(24) 6642±2264	(40) 5305±2076	(41) 4043 (Geometric)	(37) 3619	(27) 3014±1324	(30) 2671	(65) Median: 2268
	Control	(12) 7016±2482	(14) 4970±2679	(32) 4088 (geometric)	(36) 3600±1418	(33) 3276±1230	(32) 3379±1136	(88) Median: 2772
	Statistics	T-statistic: 0.452. DF:34	T-statistic: -0.481. DF:52	T-statistic: 0.093. DF:70	T-statistic (d): -1.519. DF:54.5	T-statistic: 0.793. DF:58	T-statistic: 0.981. DF:60	MannWhitney U: 2275.5. Test: Statistic Z (Corrected for ties): 2.056
	P value	0.654	0.632	0.926	0.134	0.431	0.331	0.039
Absolute neutrophil count (cells/mm^3)	Case	(24) 4437 (Geometric)	(40) 5502 (geometric)	(41) 5930 (geometric)	(37) 5156 (geometric)	(27) 5326 (geometric)	(30) 4142 (Geometric)	(65) 3938 (geometric)
	Control	(12) 6037±3069	(14) 4438±2444	(32) 5684±2370	(36) 5260 (Geometric)	(33) 5371±1528	(32) 5779±2306	(87) 4896 (geometric)
	Statistics	T-statistic: 1.034; DF:34	T-statistic (d): 2.485; DF:43.5	T-statistic (d): 1.676; DF:59.7	T-statistic: -0.423; DF:71	T-statistic (d): -1.161; DF:31.6	T-statistic (d): 1.2; DF:50.2	T-statistic: 1.525; DF:150
	P value	0.308	0.016	0.099	0.674	0.254	0.236	0.129

The proportion of wasted and stunted children are similar in febrile and afebrile groups as shown in Table 2. In below 5-year children in the pyrexial group 14% are wasted and 14% are severely wasted with an average wasting percentage of 28%. In the apyrexial group 13% are wasted and 14.44% are severely wasted with an average of 27% wasting. Among the children above 5 years also in the pyrexial group about 17% are wasted and 15% are severely wasted.

In the apyrexial group about 13% are wasted and12% are severely wasted. In the pyrexial children 19% are stunted and 14% are severely stunted. In apyrexial children 23% are stunted and 14% are severely stunted. Overall stunting in pyrexial group is 33% and in apyrexial group is 27%.

Overall, the TLC, ALC, ANC are not differing between febrile and afebrile groups in most of the age groups (Table 3). Though the mean TLC and median ALC in 10 to <16-years age group of febrile children is significantly less than that of afebrile group, it has no clinical relevance as in both groups the TLC and ALC values are within normal range for the age group.

Table 4: Haemoglobin pattern in febrile and afebrile groups, age group wise.

Age in years	Group (n)	Mean (SD)	Mean 95% CI	Median (95% CI)	Statistics	p value
<2	Febrile (64)	9.7 (1.6)	9.3 to 10.1	9.9 (9.6 - 10.4)	Mann- Whitney U: 729.50; Test Statistic Z (Corrected for ties): 0.3614	0.361
	Afebrile (26)	10.0 (1.8)	9.3 to 10.8	10.3 (9.4 - 11.2)		
2-9	Febrile (128)	10.4 (1.5)	10.2 - 10.7	10.6 (10.5 - 10.8)	Mann-Whitney U: 6775.50; Test Statistic Z (Corrected for ties): 2.392	0.016
	Afebrile (128)	10.8 (1.8)	10.5 to 11.1	11.1 (10.9 - 11.4)		
10-17	Febrile boys (42)	11.8 (1.8)	11.2 to 12.4	12.0 (11.5 - 12.3)	Mann-Whitney U: 988.00; Test Statistic Z (Corrected for ties): 0.318	0.750
	Afebrile boys (49)	11.7 (1.9)	11.1 to 12.2	11.8 (11.4 - 12.3)		
10-17	Febrile girls (32)	10.6 (2.2)	9.8 to 11.4	10.8 (9.9 - 12.0)	Mann-Whitney U: 632.5; Test Statistic Z (Corrected for ties): 1.331	0.183
	Afebrile girls (48)	11.2 (1.7)	10.7 to 11.7	11.5 (10.7 - 12.0)		

Table 5: Pulse and respiratory rate patterns in febrile and afebrile groups, age group wise.

Characteristic	Group	Age (in years)				
		Upto 1 Mean±SD	**1-3 Geometric Mean**	**3-6 Geometric Mean**	**6-12 Geometric Mean**	**>12 Mean±SD**
Pulse rate (per minute)	Case	124±24	119	110	100	91±17
	Control	127±24	110	95	92	88±15
	T-Statistic	0.371; DF: 44	-2.064; DF: 99	-4.542; DF: 108	-3.091; DF: 148.4	-0.822; DF: 81
	p value	0.712	0.041	<0.001	0.0024	0.4134
Respiratory rate (breaths per minute)	Case	39 (Geometric Mean)	32 (Geometric Mean)	30 (Geometric Mean)	Median: 26; 95% C.I: 24-27	Median: 23; 95% C.I: 22-26
	Control	42 (Geometric Mean)	33 (Geometric Mean)	25 (Geometric Mean)	Median: 24; 95% C.I: 22-24	Median: 23; 95% C.I: 22-24
	Statistics	T-statistic: 0.654; DF: 44	T-statistic: 0.879; DF: 99	T-statistic: 3.982; DF: 65.9	Mann-Whitney U: 3188.50; Z: 2.046	Mann-Whitney U: 810.00; Z: 0.204
	p value	0.5162	0.3818	0.0002	0.0408	0.8382

Table 6: Thrombocyte pattern in febrile and afebrile groups.

Thrombocyte pattern	Febrile				Afebrile			
	Frequency	Percentage	95% CI		Frequency	Percentage	95% CI	
Normal	203	77.48	71.94	82.39	219	86.90	82.10	90.81
Thrombocytopenia	30	11.45	7.86	15.94	6	2.38	0.88	5.11
Thrombocytosis	29	11.07	7.54	15.51	27	10.71	7.18	15.21

Table 7: Thrombocyte and diagnostic category association in pyrexial and apyrexial children.

Diagnosis in pyrexial children[a]				
	Normal	Thrombocytopenia	Thrombocytosis	Total (%)
Allergic	1 100.0% RT; 0.5% CT	0 0.0% RT; 0.0% CT	0 0.0% RT; 0.0% CT	1 (0.4)
Bacterial Illness	73 85.9% RT; 36.7% CT	3 3.5% RT; 10.0% CT	9 10.6% RT; 31.0% CT	85 (32.9)
Heat Pyrexia	1 100.0% RT; 0.5% CT	0 0.0% RT; 0.0% CT	0 0.0% RT; 0.0% CT	1 (0.4)
Hepatic	2 100.0% RT; 1.0% CT	0 0.0% RT; 0.0% CT	0 0.0% RT; 0.0% CT	2 (0.8)
Malaria	2 50.0% RT 1.0% CT	2 50.0% RT 6.7% CT	0 0.0% RT 0.0% CT	4 (1.6)
Malignancy	0 0.0% RT; 0.0% CT	2 100.0% RT; 6.7% CT	0 0.0% RT; 0.0% CT	2 (0.8)
Musculoskeletal	3 60.0% RT; 1.5% CT	0 0.0% RT; 0.0% CT	2 40.0% RT; 6.9% CT	5 (1.9)
Pulmonary	1 100.0% RT 0.5% CT	0 0.0% RT 0.0% CT	0 0.0% RT 0.0% CT	1 (0.4)
Renal	3 100.0% RT; 1.5% CT	0 0.0% RT; 0.0% CT	0 0.0% RT; 0.0% CT	3 (1.2)
Viral illness	113 73.4% RT; 56.8% CT	23 14.9% RT; 76.7% CT	18 11.7% RT; 62.1% CT	154 (59.7)
Total (%)	199 (77.1)	30 (11.6)	29 (11.2)	258
Diagnosis in apyrexial children[b]				
Bacterial illness	36 81.8% RT; 18.8% CT	1 2.3% RT; 20.0% CT	7 15.9% RT; 36.8% CT	44 (20.4)
Bleeding diathesis	3 100.0% RT; 1.6% CT	0 0.0% RT; 0.0% CT	0 0.0% RT; 0.0% CT	3 (1.4)
Cardiomyopathy	1 100.0% RT; 0.5% CT	0 0.0% RT; 0.0% CT	0 0.0% RT; 0.0% CT	1 (0.5)
Conversion reaction	8 100.0% RT; 4.2% CT	0 0.0% RT; 0.0% CT	0 0.0% RT; 0.0% CT	8 (3.7)
Endocrinal	9 100.0% RT; 4.7% CT	0 0.0% RT; 0.0% CT	0 0.0% RT; 0.0% CT	9 (4.2)
Hepatic	1 100.0% RT; 0.5% CT	0 0.0% RT; 0.0% CT	0 0.0% RT; 0.0% CT	1 (0.5)
Lymphadenopathy	6 100.0% RT; 3.1% CT	0 0.0% RT 0.0% CT	0 0.0% RT 0.0% CT	6 (2.8)
Malignancy	1 100.0% RT; 0.5% CT	0 0.0% RT; 0.0% CT	0 0.0% RT; 0.0% CT	1 (0.5)
Musculoskeletal	9 100.0% RT; 4.7% CT	0 0.0% RT 0.0% CT	0 0.0% RT; 0.0% CT	9 (4.2)
Neurological	67 84.8% RT; 34.9% CT	3 3.8% RT; 60.0% CT	9 11.4% RT; 47.4% CT	79 (36.6)
Pulmonary	18 90.0% RT; 9.4% CT	0 0.0% RT; 0.0% CT	2 10.0% RT; 10.5% CT	20 (9.3)
Renal	14 93.3% RT; 7.3% CT	0 0.0% RT 0.0% CT	1 6.7% RT 5.3% CT	15 (6.9)
Viral illness	18 94.7% RT; 9.4% CT	1 5.3% RT; 20.0% CT	0 0.0% RT; 0.0% CT	19 (8.8)
Worm infestation	1 100.0% RT; 0.5% CT	0 0.0% RT; 0.0% CT	0 0.0% RT; 0.0% CT	1 (0.5)
Total (%)	192 (88.9)	5 (2.3)	19 (8.8)	216

[a]Chi-squared: 35.347; DF: 18; P=0.0085; Contingency coefficient: 0.347, [b]Chi-squared: 12.571; DF: 26; P=0.9875; Contingency coefficient: 0.235

In the age group 1 to <2 years the mean ANC in pyrexial group is significantly greater than that of afebrile group. But it is not clinically significant as in both groups the ANC is within normal range for the age group.

As shown in Table 4, in the age group less than 2 years, both the cases and controls showed mild anaemia and no significant difference was observed. Children of the age group of 2-9 years in both cases and controls showed mild anaemia with significant difference. In the age group of 10-17 years haemoglobin values of both groups are less than the normal but no significant difference was found.

Table 5 presents the changes in the mean pulse rate in the study groups. The mean pulse rate in the children of age groups, 1-3 years, 4-6 years and 7-12 years are significantly more than that of afebrile children. The respiratory rates (RR) in the children of both groups are not significantly differing from each other in the age group up to <1 year and 1-3 years. In the age group 4-6 years mean RR of febrile children is significantly more than that of afebrile children and marginally greater than normal range.

As given in Table 6, prevalence of thrombocytopenia is 11.5%, 95% C.I 7.86% to 15.94, in febrile children. It is significantly greater than the prevalence of thrombocytopenia in afebrile group 2.38%, 95% C.I. 0.88% to 5.11%. Prevalence of thrombocytosis is not differing significantly between febrile (11.07%, 95% C.I 7.54%-15.51%) and afebrile children (10.71%, 95% C.I 7.18%-15.21%).

Table 7 presents the diagnostic categorical association in both study groups. In the pyrexial group the common diseases are viral illness (59.7%: 154 out of 258), bacterial illness (33%: 85 out of 258), musculoskeletal (1.9%: 5 out of 258) and malaria (1.6%: 4 out of 258). In the apyrexial group the common diseases are neurological (36.6%:79 of 216), bacterial illness (20.4%: 44 of 216), pulmonary (9.3%: 20 of 216), viral illness (8.8%: 19 of 216).

Table 8 presents the frequency of organisms in both blood and urine culture. In the pyrexial group 91.4% (95% CI 87.4 to 94.5) of children had sterile blood culture and 94% (95% CI 90.49 to 96.55) had sterile urine cultures. Only 6.34% of febrile children had bacterial pathogen in the blood and 4.1% of febrile children in the study had bacterial pathogen in urine. This shows that most of the febrile illnesses in the study are of non-bacterial causes, probably viral illnesses. Two children with fever had bacterial pathogen in the pus. In the apyrexial group of children about 97% have sterile blood culture (95% CI 94.07 to 98.67) and 96% (95% CI 92.61 to 97.89) have sterile urine cultures. This is indicative of predominantly nonbacterial causes in afebrile group. Only 6 children without fever had bacterial pathogens in the pus culture.

Widal test is found to be of no use in distinguishing the pyrexial children (n=61; SO range: 20 to 160; Median 20) from apyrexial children (n=73; SO range: 20 to 320; Median 20), Mann Whitney U: 1858.0; Test Statistic Z corrected for ties: 1.940; p 0.052.

CRP quantitative test is also found to be of no use in distinguishing the pyrexia children (n=55; range: 0.0 to 96.0; Median 48.0) from apyrexia children (n=9; range: 12.0 to 96.0; Median 24), Mann Whitney U: 196.0; Test Statistic Z Corrected for ties: 1.034; p 0.301.

Table 8: Frequency of organisms in blood and urine culture in the study groups.

Organisms	Cases (n=268)	Control (n=262)
	N (%)	N (%)
Blood		
Aerobic spore bearers	1 (0.37)	1 (0.38)
CONS	4 (1.49)	1 (0.38)
Diptheroids	1 (0.37)	-
E. coli	2 (0.75)	-
Klebsiella	3 (1.12)	-
MRSA	1 (0.37)	-
MSSA	2 (0.75)	1 (0.38)
No growth	245 (91.42)	254 (96.95)
Salmonella typhi	1 (0.37)	-
Staphylococcus aureus	6 (2.24)	1 (0.38)
Staphylococcus aureus; Acinetobacter	1 (0.37)	-
Stenotrophomonas maltophilia	1 (0.37)	-
Pseudomonas aeruginosa	-	4 (1.53)
Urine		
Candida	4 (1.49)	1 (0.38)
Contaminants grown	-	2 (0.76)
E. coli	9 (3.36)	5 (1.91)
Enterococcus	-	2 (0.76)
Insignificant *Proteus species*	1 (0.37)	5
Klebsiella	2 (0.75)	-
Mixed growth	-	1 (0.38)
No growth	252 (94.03)	251 (95.8)

DISCUSSION

Thrombocytopenia is not uncommon in a sick child. It is usually found in infections: viral, fungal, and bacterial; malignancies, and due to drugs. In this study of children admitted to a rural teaching hospital, the prevalence of thrombocytopenia among in-patient, non-serious children and thrombocytopenia prevalence in subgroups of febrile and afebrile children and the etiology of fever associated with thrombocytopenia were studied.

In this study, 1-3 years children are mainly affected with pyrexial problem. This shows pyrexia is a predominant

problem in one to three years age group of children. After 3 years the children are likely to develop immunity against common infections due to natural immunity and vaccination. This was similar to the observation done by Subramanian et al.[9] In this study pyrexial illnesses observed are not showing any sex predilection but male child predominance was seen in the study. This was in accordance with the findings of Badvi et al.[10] In this study, rural children are the predominant population in both pyrexia and apyrexial children and there is no geographical predilection for pyrexial illnesses.

In our study overall prevalence of acute malnutrition in the entire population of children studied is about 28-32%. This is a concerning observation as the children of both below and above 5 years age groups are having some degree of wasting. This reflects prevalent nutritional problem (acute malnutrition) in this population of children. This is a poor indicator of health of the society from which the children are coming. This sort of prevalence of acute malnutrition in all age groups of this area is matter of concern and needs further studies to find the reason for it and appropriate corrective measures.

Haematological parameters related to white blood cells (TLC, ANC, ALC) are not showing any significant abnormalities and are not distinguishing between febrile and afebrile children. This indicates that the disease patterns observed in either pyrexial or apyrexial group are not of the nature of influencing white blood cells, Probably routine WBC parameters are not of much diagnostic utility in non-serious febrile children.

The marginal increase in the pulse rate and respiratory rate can be explained due to fever and mild degree of anemia in the pyrexial group and mild anemia in the apyrexial group.

Many children in pyrexial and apyrexial group are having normal platelet counts. The prevalence of thrombocytopenia is significantly more in pyrexial group (11.45%, 95% CI 7.9 to 16%) compared to apyrexial group (2.4%, 95% CI 0.9 to 5.1%). This indicates that the pyrexial illnesses observed in this study are having some predilection to cause thrombocytopenia.Thrombocytosis is equally found in both pyrexial and apyrexial children indicating that there are no predominant illnesses with a tendency to cause thrombocytosis in anyone group.

Most of the studies of childhood fever and thrombocytopenia were done in a narrowly defined population with a specific etiology of fever.[11] But studies to find broad etiology of fever in children are scanty. This study is comprehensive to find common etiologies of childhood fevers and prevalence of thrombocytopenia associated with fever.

Badvi et al, in year 2012 did a study in a cohort of febrile children. In this study febrile group is compared with afebrile group (controls). Authors could not find studies done with a control group. So, our study with fever cases compared with controls (afebrile) gives better picture of clinical and laboratory patterns related to febrile illness in childhood and associated thrombocytopenia.

In this study, the common etiology found was viral illness accounting nearly 59.7% cases in pyrexia group followed by bacterial illness (32.9%). Other infections related to renal and musculoskeletal disorders are noted in pyrexia group. In a study done at Delhi, it was demonstrated that common causes of thrombocytopenia was viral fever followed by dengue, enteric fever, chikungunya and malaria.[12] Similar to our study, Kumaran also found viral fever to be the commonest cause of thrombocytopenia (50.3%) cases.[13] In contrast to this, malaria was found to be the common cause (41.07%) in a study done by Gandhi.[14] These differences could be due to the seasonal variations and or geographical variation of etiologies. In another study by Bhalra, dengue was found as the main aetiology (60.8%).[15] In this study dengue was found only in (3.35%) cases in pyrexia group.

The common aetiology of thrombocytopenia in apyrexia group was neurological disorder (36.6%) followed by bacterial illness (20.4%), pulmonary disorders (9.3%), viral illness (8.8%) and renal disorders (6.9%). The neurological problem is mainly epilepsy and children are on antiepileptic drugs like sodium valproate, carbamazepine which may be causing decrease in platelets in some afebrile group.

CONCLUSION

Pyrexia is predominant problem in 1-3 years age group of children. There is no sex predilection for pyrexial illnesses. Overall prevalence of thrombocytopenia in our study is 7%. Prevalence of thrombocytopenia in the pyrexia group is 11.45% (95% CI 7.86% to 15.94%). Prevalence of thrombocytopenia in the apyrexia group is 2.38% (95% CI 0.88% to 5.11%).

Diseases associated with clinically significant thrombocytopenia, especially malaria and dengue, are less prevalent in this area. But the small number of these diseases in this study are having considerable proportion of thrombocytopenia. Among febrile thrombocytopenia cases, the commonest febrile childhood illness in our study is viral illness (76.7%). Among Viral illnesses in the febrile group 14.9% had thrombocytopenia. Among afebrile thrombocytopenia cases, the commonest afebrile childhood illness in our study is neurological disorder (60%). Among the neurological disorders in afebrile group 3.8% had thrombocytopenia. The findings conclude that, fever with thrombocytopenia is one of the most common challenges in medicine field. Thrombocytopenia is common hematological evaluation done in a sick child. It is important in understanding the underlying pathophysiology in the development of diseases and to treat the thrombocytopenia.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Pinnamaneni P, Devabhakthuni R, Chodavarapu R. Clinical epidemiology of paediatric febrile and afebrile in-patients and their association with thrombocytopenia. Int J Contemp Pediatr 2020;7:972-9.