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Immune Thrombocytopenia Purpura among the Various Age Groups Patients Attending Jaypee Multi-super Speciality World Class Hospital Noida

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Authors' contribution

This work was carried out in collaboration among all authors. The authors hereby declared that presented in this article is original and that any liability for claims relating to the content of this article will be borne by them. All authors read and approved the final manuscript.

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ABSTRACT

Background: Immune mediated thrombocytopenia (ITP) is a common manifestation of autoimmune disease in children. Although patients often present with bruises, petechiae, and some mucosal bleeding, the incidence of life-threatening hemorrhage is rare (0.2-0.9%) but can be fatal when presenting in vital organs.
Study Setting and Design: A facility based cross sectional study was conducted from May 2019 to January 2020 at Jaypee Multi-super Speciality World-class Hospital Laboratory Medicine, sector 128 Noida. This health facility is located in utter Pradesh (UP) in India and is a source of medical care for the underserved population. This research was designed to investigate immune thrombocytopenia purpura among 151 patients attending Jaypee Multi-Super Speciality World Class Hospital Noida.
Methodology: The Complete Blood Count (CBC) was carried out using an automated analyzer (sysmex XN-1000).
Coagulation Analysis procedure (Prothrombin Time (PT) Test and Activated Partial Thromboplastin

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Time (APTT) was carried out using a Coagulation Analyzer (Destiney plus).
Results: The total subjects with Thrombocytopenia purpura in this research are 151 subjects, 100 (66.2%) are male and the remaining 51 (33.8%) were female respectively. Immune Thrombocytopenic Purpura. Out of 151 subjects recruited for this study Immune Thrombocytopenic Purpura was recorded 23 subjects (15.2%) in which 12 (7.95%) are male and 11(7.29%) were female. This result showed that, the 48 patients (31.8) of the subjects were having a Prothrombin Time (PT) value of less than 14.9 seconds while, the 103 patients (68.2) showed Prothrombin Time of greater than 14.9, the 14.9 was the normal range. Activated Partial Thrombin Time (APPT) of less than 23.0 seconds were recorded in 103 patients (68.2%) of the subjects while, Activated Partial Thrombin Time of greater than 23.0 seconds were recorded in 48 patients (31.8%) of the subjects. International Normalize Ratio (INR) of less than 1.1 were recorded in 43 patients (28.5%) of the subjects while, International Normalize Ratio of greater than 1.1 were recorded in 108 patients (71.5%) of the subjects.

Keywords: Thrombocytopenia; immune thrombocytopenia; complete blood count; prothrombin time and activated partial thromboplastin time.

1. INTRODUCTION

Thrombocytopenia is the disease in which there is less formation of a platelet in blood or a decrease in the platelet count. The normal range of adult platelet count range is 150,000 to 450,000/μL, with mean values of 266,000 and 237,000/μL in females and males, respectively [1]. If the platelet count is less than the normal range cause thrombocytopenia. Severity of Thrombocytopenia can be subdivided into 3 main groups, Platelet count between 100,000 to 150,000/μL are defined as mild thrombocytopenia, platelet count between 50,000 to 99,000/micro as moderate thrombocytopenia and <50,000/micro as severe thrombocytopenia, with a risk of bleeding problems [2]. Platelets play a vital role in the blood clot.

Immune thrombocytopenia (ITP) is a uncommon condition. It is due to a B-cell (and in some patients to a CD81 T-cell) autoimmune reaction directed against circulating platelets and megakaryocytes, essential to life-threatening bleeding in some patients. Immune thrombocytopenic purpura (ITP) patients often present with petechiae, bruising, and mucosal bleeding. A life-threatening hemorrhage is rare, especially in acute ITP. Immune thrombocytopenic purpura may be manifested in acute or chronic forms and in primary or secondary forms. A wide variety of therapeutic regimens are currently used for the treatment of ITP due to autoantibodies [3]. The main diagnostic procedure for ITP is based on patient history, physical examination, peripheral smear examination and complete blood count, Peripheral blood examination reveal normal-to-large platelets with normal red cell and white cell morphologies. Bone marrow aspirates show normal, or improved number of megakaryocytes [4]. Immune thrombocytopenic purpura is a diagnosis of exclusion. Other causes of thrombocytopenia should be ruled out, and these include drug-induced thrombocytopenia, bone marrow failure, inherited thrombocytopenia, microangiopathic and leukemic thrombocytopenias, and other disorders associated with thrombocytopenia [5].

The aim of this research is to determine the immune thrombocytopenia purpura among various age groups patients that attend Jaypee Hospital Noida.

2. MATERIALS AND METHODS

2.1 Material

EDTA tubes, 2ml needle and syringe, Centrifuge, Xn-1000 sysmex hematology analyzer and coagulation analyzer destiny plus.

2.2 Study Setting and Design

A facility based cross sectional study was conducted from May 2019 to January 2020 at Jaypee Multi-super Speciality World-class Hospital Laboratory Medicine, sector 128 Noida. This health facility is located in utter Pradesh (UP) in India and is a source of medical care for the underserved population. This research was designed to investigate immune thrombocytopenia purpura among 151 patients attending Jaypee Multi-Super Speciality World Class Hospital Noida.

2.3 Exclusion and Inclusion Criteria

All immune thrombocytopenia purpura patients who came to Jaypee Multi-Super Speciality World Class Hospital for complete blood count and coagulation analysis, haematology department were screened for eligibility in the study. The data was collected from the patients with hepatitis B virus infection, Human Immunodeficiency Virus (HIV), Dengue virus and those having bleeding during sickness, recently transfused, having known chronic diseases and diagnosed with hemoglobinopathies were excluded.

2.4 Procedure for Sample Collection

2.4.1 Venous blood collection

Venous blood is generally taken from the antecubital vein with a sterile 20 or 21 SWG needle and a dry sterile syringe. A vacuum tube (for example, a Vacutainer) may be used. In persons whose veins are not easily seen or felt, the skin area may be warmed and a tourniquet or sphygmomanometer cuff applied. Clean the area of venipuncture with 70% alcohol and allow it to dry before inserting the sterile needle into the vein. Draw blood into the syringe, remove the tourniquet or sphygmomanometer cuff and withdraw the needle, keeping the swab in place for a few minutes to ensure that any leaking is staunched.

2.4.2 Complete blood count (CBC) [6,7]

The Complete Blood Count **(**CBC) was carried out using an automated analyzer (sysmex XN-1000).

2.4.3 Coagulation analysis

Coagulation Analysis procedure (Prothrombin Time (PT) Test and Activated Partial Thromboplastin Time (APTT) was carried out using a Coagulation Analyzer (Destiney plus) [8,9].

2.4.4 Data management/analysis

The data collected was transferred into a Microsoft Access database and then analyzed using SPSS software. Descriptive statistics such as frequency, percentage, mean and standard deviation were used to describe dependent and independent variables. Regression analysis had been used to check for association between dependent and independent variables. In all cases *P value* less than 0.05 was considered statistically significant.

3. RESULTS AND DISCUSSION

Table 1. Shows the data of coagulation test of 151 patients (Male = 100, Female = 51) at Jaypee Super Multispecialty Hospital Noida India, the table entitle the Hospital Number, Gender, Platelet Count, Prothrombin Time (PT), International Normalized Ratio (INR) and Activated Partial Thromboplastic Test (APTT).

Table 2: shows total number of Patients with Thrombocytopenia purpura according Gender differences, the total number male patients in this research was 100 in number which was 66.2%, whereas the total number female patients in this research was 51 in number which was 33.8%.

Table 3: Shows the social distribution of thrombocytopenia purpura based on ages group of the subjects which showed that 13.9% (21) of the subjects are between the ages of 1-10, 1.9% (03) are between the ages of 11-20, 14.6% (22) are between the ages of 21-30, 11.9% (18) are between the ages of 31-40, 10.6% (16) are between the ages of 41-50, 15.9% (24) are between the ages of 51-60, 16.6% (25) are between the ages of 61-70, 4.0% (06) were between the ages of 71-80, 9.3% (14) were between the ages of 81-90 and 1.3% were between the ages of 91-100.

Table 3 shows the Social distribution of subjects with Immune Thrombocytopenic Purpura. Out of 151 subjects recruited for this study, Immune Thrombocytopenic Purpura was recorded on 23 subjects (15.2%) in which 12 (7.95%) were male and 11(7.29%) were female. Since the number of male patients in the study was almost double than number of female patients. Therefore, the ration between male and female were 1:2 which was agreed with the study of Neelaveni et al. which stated that In our study age group ranged between 11-40 years with mean age 26.28 years with female predominance and male to female ratio 1:2.8 [10].

Table 1. Data of coagulation test of 151 patients (Male = 100, Female = 51) at Jaypee Super Multispecialty Hospital Noida India

S/N	Hospital number	Gender	Age	PLT count	Prothrombin time	INR	APTT
1	JHN00209544	M	26	50	13	0.97	26.2
2	JHN00210243	M	55	80	13	0.97	26.5
3	JHN000204939	M	83	10	19.9	1.38	34.2
4	JHN000205390	M	82	75	17.7	1.28	22
5	JHN000210650	M	45	114	15.1	1.11	25.4
6	JHN000210830	M	25	12	13.4	0.99	26
7	JHN000184968	M	55	102	16.8	1.22	26.9
8	JHN000201073	M	26	95	13.3	0.99	27.6
9	JHN000207235	M	43	48	25.7	1.81	50
10	JHN000192897	M	53	63	16.2	1.18	35.6
11	JHN000207255	M	32	65	38.5	2.62	59
12	JHN000210215	M	55	90	23.5	1.67	39.9
13	JHN000210812	M	56	111	18.2	1.32	22.3
14	JHN000206887	M	40	99	20.4	1.44	37.4
15	JHN000210929	M	58	10	21.3	1.52	31.8
16	JHN000210971	M	2	45	21.7	1.55	38
17	JHN00060660	M	63	9	12.6	1.07	32.8
18	JHN000208571	M	74	45	18.4	1.33	23.5
19	JHN000210124	M	2	28	28.6	2	60.1
20	JHN000211151	M	64	60	46.9	3.14	32.7
21	JHN000174961	M	57	10	18.7	1.33	32.3
22	JHN000209393	M	81	70	18.6	1.34	39.1
23	JHN000209449	M	68	101	24.5	1.12	29.8
24	JHN000192935	M	80	55	22.4	1.15	22.8
25	JHN000195743	M	72	70	17.8	1.19	24.4
26	JHN000209544	M	26	25	13.1	0.98	26.2
27	JHN000139499	M	48	7	12.7	1.43	26.1
28	JHN000152118	M	53	40	17.1	1.25	39.5
29	JHN002097539	M	22	81	19.1	1.4	33.1
30	JHN000117539	M	46	87	21.2	1.33	29.7
31	JHN000209887	M	40	108	20	1.44	37.4
32	JHN002093932	M	81	95	18.6	1.34	29.1
33	JHN000210124	M	2	20	28.6	2.1	60.2
34	JHN000210243	M	55	80	19.5	1.23	36.6
35	JHN000201072	M	26	97	13.3	0.99	27
36	JHN000192897	M	53	81	16.2	1.18	35.6
37	JHN000206887	M	40	106	20	1.44	37.4
38	JHN000210121	M	2	70	18.2	1.2	23.8
39	JHN000209544	M	96	40	13	0.97	26.1
40	JHN000208639	M	2	56	14.7	1.33	25.9
41	JHN000102483	M	70	100	20	1.45	38.9
42	JHN000208639	M	2	63	15.6	1.14	35.9
43	JHN000210500	M	45	114	15.1	1.11	25.5
44	JHN000204930	M	83	10	12.9	1.17	28.1
45	JHN000192935	M	86	47	17.5	1.7	27.2
46	JHN000211251	M	64	80	46.1	2.55	32.7
47	JHN000209541	M	26	38	13	0.9	26.2
48	JHN000207325	M	43	100	25.7	1.18	50.6
49	JHN000201072	M	26	106	13.3	0.9	27.6
50	JHN000192893	M	53	93	16.2	1.18	33.6
51	JHN000209044	M	68	77	14.6	1.44	29.8
52	JHN000210123	M	2	47	12.4	0.9	25.3
53	JHN000210929	M	58	90	19.9	1.16	30.1

S/N	Hospital number	Gender	Age	PLT count	Prothrombin time	INR	APTT
54	JHN000209339	M	81	41	18.7	1.34	29.1
55	JHN000117539	M	40	84	23.4	1.55	30.8
56	JHN000207233	M	43	36	25.7	1.8	50.6
57	JHN000208639	M	3	70	15.6	1.14	25.5
58	JHN000288628	M	5	32	19.1	1.09	23.8
59	JHN000018260	M	67	110	16.2	1.18	40.2
60	JHN000319288	M	87	56	22.3	1.59	27.8
61	JHN000319756	M	83	72	22.7	1.6	28.5
62	JHN000264352	M	52	63	12.2	0.91	22.3
63	JHN000266095	M	5	32	17.3	1.5	33.1
64	JHN000193044	M	2	55	15.6	1.18	25.7
65	JHN000309228	M	9	93	13.2	1.14	36.8
66	JHN000309410	M	83	10	12.5	0.99	25.4
67	JHN000317394	M	82	82	17.7	1.02	26.4
68	JHN000037830	M	40	90	20	1.28	36.3
69	JHN000318621	M	48	10	17.6	1.44	22.5
70	JHN000068745	M	68	64	20.5	1.28	28.5
71	JHN000316509	M	45	90	15.1	1.47	31.3
72	JHN000224949	M	52	3	17.9	1.11	20.5
73	JHN000318986	M	2	45	13.6	1.3	24.5
74	JHN000312066	M	38	111	13.3	1.14	40.2
75	JHN000315048	M	55	107	18.8	0.9	21.3
76	JHN000319044	M	83	10	15.7	1.22	31.8
77	JHN000320562	M	82	76	17.7	1.09	28.1
78	JHN000321353	M	53	64	16.2	1.28	29.7
79	JHN000026407	M	56	103	18.2	1.18	34.1
80	JHN000195825	M	32	57	22.6	1.32	28.4
81	JHN000307877	M	24	109	16.2	1.62	32.2
82	JHN000071285	M	30	92	15.2	1.18	29.5
83	JHN000325662	M	38	110	14.8	1.09	31.3
84	JHN000839063	M	50	98	14.2	1.05	24.6
85	JHN000327520	M	68	120	15.5	1.14	45.5
86	JHN000055496	M	32	78	13.4	0.99	22.6
87	JHN000313299	M	64	101	16.2	1.18	39.1
88	JHN000320945	M	32	38	3.4	0.99	20.2
89	JHN000184223	M	76	89	22.5	1.6	31.5
90	JHN000312702	M	74	94	15.4	1.13	43.4
91	JHN000088318	M	28	112	13.6	1.01	35.2
92	JHN000123551	M	26	118	14.7	1.08	26.7
93	JHN000201378	M	82	63	17.2	1.25	43.4
94	JHN000260097	M	66	79	17.7	1.28	32.3
95	JHN000320242	M	26	106	17.8	1.29	28.3
96	JHN000325053	M	28	95	15.4	1.13	26.4
97	JHN000040365	M	8	86	14.8	1.09	32.1
98	JHN000309456	M	16	99	15.6	1.14	31.4
99	JHN000318626	M	2	116	16.3	1.19	42.9
100	JHN000038906	M	72	58	15.3	1.12	30.4
101	JHN000210830	F	25	12	13.3	0.99	21.4
102	JHN000210215	F	55	90	14.9	1.09	35.5
103	JHN000210971	F	2	45	25.6	1.83	37.6
104	JHN000060660	F	63	9	18.7	1.76	40.6
105	JHN000017496	F	53	10	16.4	1.99	39.7
106	JHN000193184	F	63	68	14.7	1.08	23.9
107	JHN000204400	F	15	35	13.8	1.09	28.6
108	JHN000210030	F	25	10	12.6	0.98	20.8
109	JHN000210814	F	48	55	16.8	1.21	29.9

S/N	Hospital number	Gender	Age	PLT count	Prothrombin time	INR	APTT
110	JHN000209741	F	56	19	13.9	1.05	31.4
111	JHN000087628	F	2	110	20.8	1.88	28.4
112	JHN000210971	F	63	10	12.5	1.09	25.5
113	JHN000188697	F	59	85	19.3	1.97	29.5
114	JHN000084035	F	63	54	15.6	1.33	31.4
115	JHN000181617	F	64	109	21.4	1.13	22.3
116	JHN000160660	F	4	13	12.5	1.16	24.6
117	JHN000210500	F	2	86	23.2	1.11	35.6
118	JHN000210791	F	54	82	17.9	1.19	42.5
119	JHN000209419	F	25	19	13.3	1.9	21.5
120	JHN000209042	F	54	88	18.7	1.09	31.4
121	JHN000210830	F	64	96	17.9	1.19	23.4
122	JHN000021500	F	15	15	14.7	1.21	31.9
123	JHN000020400	F	63	10	13.8	1.09	42.3
124	JHN000060661	F	69	100	24.8	1.81	53.5
125	JHN000198334	F	25	45	13.8	1.96	32.4
126	JHN000210830	F	57	90	15.9	1.094	25.6
127	JHN000211373	F	34	117	16.8	1.05	34.5
128	JHN000060715	F	46	36	19.4	1.02	44.5
129	JHN000206169	F	2	9	12.9	1.77	40.5
130	JHN000209424	F	43	99	21.8	1.8	46.6
131	JHN000020686	F	39	99	14.2	1.06	36.8
132	JHN000327665	F	67	50	21.1	1.51	23.6
134	JHN000016511	F	5	32	17.8	1.5	20.4
135	JHN000309235	F	37	75	16.4	1.44	34.6
136	JHN000326277	F	67	110	16.7	1.18	45.7
137	JHN000310391	F	69	85	13.5	1.54	41.2
138	JHN000122838	F	30	111	15.2	1.12	39.9
139	JHN000029051	F	38	119	14.8	1.09	24.8
140	JHN000316963	F	45	70	21	1.5	20.8
141	JHN000183165	F	32	115	14.3	1.05	34.8
142	JHN000186879	F	66	36	13.7	1.01	23.9
143	JHN000006575	F	30	96	16.1	0.95	20.5
144	JHN000152793	F	98	100	12.7	1.13	36.9
145	JHN000217189	F	67	59	18.1	1.65	40.2
146	JHN000240434	F	49	118	23.3	1.16	27.9
147	JHN000321351	F	26	98	18.8	1.36	50.9
148	JHN000225550	F	48	68	15.8	1.2	24.5
149	JHN000264708	F	35	100	18.5	1.46	53.8
150	JHN000175514	F	33	110	20.3	1.6	32.4
151	JHN000319478	F	28	117	13.3	1.05	20.7
152	JHN000035091	F	64	115	14.6	1.07	23.5

Table 2. Total number of patients with Thrombocytopenia purpura according gender differences

Gender	Frequency	Percentage
Male	100	66.2
Female	51	33.8

Table 4, showed the social distribution of Immune Thrombocytopenic Purpura based on age group of the subjects shows that 3 patients (13.0%) were between the ages of 1-10, only 1 patient (0.66%) were between the ages of 11-20, 04 patients (2.64%) were between the ages of 21-30, 0.0 patients (0.0%) are between the age of 31-40, 02 patients (1.32) were between the ages of 41-50, 05 (3.31) were between the ages of 51-60, 04 patients (2.64%) were between the ages of 61-70, , 0.0 patients (0.0%) were between the age of 71-80, 04 patients (2.64%) were between the ages of 81-90 and 0.0 patients (0.0%) were between the age of 91-100.

Table 3. Social distribution of subjects with thrombocytopenia purpura

Age	Frequency	Percentage
1-10	21	13.9
11-20	03	1.9
21-30	22	14.6
31-40	18	11.9
41-50	16	10.6
51-60	24	15.9
61-70	25	16.6
71-80	06	4.0
81-90	14	9.3
91-100	02	1.3

Table 4. Only patients with immune thrombocytopenic purpura

Gender	No. of Patients	Frequency	Percentage (%)
Male	100	12	7.95
Female	51	11	7.29
Total	151	23	15.2

Table 5. Social distribution of subjects with Immune thrombocytopenic purpura

Age	Frequency	Percentage
1-10	03	1.99
11-20	01	0.66
21-30	04	2.64
31-40	00	0.0
41-50	02	1.32
51-60	05	3.31
61-70	04	2.64
71-80	00	0.0
81-90	04	2.64
91-100	00	0.0
Total	23	15.2

Table 6. Coagulation parameters, frequency of distribution and percentage (%) of Prothrombin Time (PT), Activated Partial Thrombin Time (APPT) and International Normalize Ratio (INR)

Coagulation parameters	Frequency	Percentage (%)
Prothrombin Time (Sec.)		
<14.9	48	31.8
>14.9	103	68.2
Activated Partial Thromboplastin Time (Sec.)		
<23.0	103	68.2
≥23.0	48	31.8
International Normalize Ratio		
<1.1	43	28.5
>1.1	108	71.5

Table 5, showed a frequency distribution of Prothrombin Time (PT), Activated Partial Thrombin Time (APPT) and International Normalize Ratio (INR) among the subject populations recruited for this study.

The result showed that, the 48 patients (31.8) of the subjects were having a Prothrombin Time (PT) value of less than 14.9 seconds while, the 103 patients (68.2) showed Prothrombin Time of greater than 14.9, the 14.9 was the normal

range. Activated Partial Thrombin Time (APPT) of less than 23.0 seconds were recorded in 103 patients (68.2%) of the subjects while, Activated Partial Thrombin Time of greater than 23.0 seconds were recorded in 48 patients (31.8%) of the subjects. International Normalize Ratio (INR) of less than 1.1 were recorded in 43 patients (28.5%) of the subjects while, International Normalize Ratio of greater than 1.1 were recorded in 108 patients (71.5%) of the subjects.

4. CONCLUSION

Immune thrombocytopenic purpura is an uncommon condition that tends to resolve spontaneously within 6 months of presentation. Although usually self-limited, ITP can be a worrisome diagnosis for families and clinicians. Serious hemorrhagic complications of ITP seldom occur, regardless of whether symptoms persist beyond 6 months. Our result showed the male to female ratio was 1:2 and therefore, females are more susceptible to Immune thrombocytopenic purpura than males.

CONSENT AND ETHICAL APPROVAL

As per international standard or university standard guideline participant consent and ethical approval has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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