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Research Article

**CLINICAL PROFILES OF THE CHILDREN'S SUFFERING  
FROM KAWASAKI DISEASE AND ITS OUTCOMES**<sup>1</sup>Dr Ammara Iqbal, <sup>2</sup>Dr Amira Batool, <sup>3</sup>Misbah Rahat<sup>1</sup>Gujranwala Medical College<sup>2</sup>University Medical and Dental College Faisalabad<sup>3</sup>Gomal University Dera Ismail Khan

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**Abstract:**

**Objective:** To elaborate the data of demography, clinical results, laboratory findings, echocardiographic outcomes, treatment and outcome in the children suffering from Kawasaki Disease.

**Methodology:** This is retrospective research work. This research work carried out in Jinnah Hospital, Lahore from June 2014 to January 2020. All the children who were fulfilling the criteria of Kawasaki disease in accordance with the prescription of AHA (American Heart Association) and guidelines of American Academy of Pediatrics were the participants of this research work.

**Results:** We included 25 patients who were fulfilling the criteria of Kawasaki Disease. The average age of the patients was 43 months with a range from 4 to 150 months. There were 76% male patients. 72.0% (n: 18) patients were suffering from complete Kawasaki Disease and 28.0% (n: 7) patients were suffering from incomplete Kawasaki Disease. Fever from greater than 5 days was available in 80.0% (n: 20) patients. 32.0% (n: 8) patients were present with echocardiographic alterations, among them 25.0% (n: 2) patients had complete Kawasaki Disease and 75.0% (n: 6) patients had incomplete Kawasaki Disease. We gave intravenous immunoglobulin to every patient of the study. 60% (n: 15) patients obtained intravenous immunoglobulin in 10 days of the fever. There was no requirement of 2<sup>nd</sup> dose in any patient. We gave high dose of aspirin to all the patients at the time of diagnosis which was decreased to anti-platelet dose after fever resolution for  $\geq 2$  days. 72% (n: 18) patients completed whole follow up. The follow up of complete six months displayed the resolution of the echocardiographic alterations in 75.0% (n: 6) patients, 12.50% (n: 1) patient did not complete follow up and 12.50% (n: 1) patient was present with the persistent dilatation of coronary artery.

**Conclusion:** There was prevalence of complete Kawasaki Disease in 72% patients. There was presence of abnormalities of coronary artery in 1/3<sup>rd</sup> of these patients, at younger age and it was more frequent among those patients present with incomplete Kawasaki disease but most of the patients recovered from this disease.

**KEYWORDS:** Coronary Artery, Dilatation, Kawasaki, Immunoglobulin, Abnormalities, Echocardiographic.

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**INTRODUCTION:**

There is unacknowledged etiology of Kawasaki Disease because of its self-limiting nature [1, 2]. It makes the involvement of different vessels of different organs with preference for coronary arteries [2, 3]. This disease normally occurs in children having less than 5 years of age with prevalence in all the races of the world [4]. The criteria based on symptoms is normally used for the Kawasaki Disease diagnosis [5]. Kawasaki Disease can cause the aneurysms coronary artery in 25.0% of non-treated patients [6]. The therapy with the IVIG (Intravenous Immunoglobulin) and treatment with aspirin decreases the risk of the abnormalities of coronary arteries when managed within 10 days of the onset of fever [1, 5, 6]. Kawasaki Disease is one of the main causes of the heart disease among pediatrics in developed regions of the world [6]. There is high occurrence of Kawasaki Disease in India [3, 7]. Research works in our country Pakistan are not abundant. There is only one research work in our country which examined the pattern of cardiovascular involvement among children suffering from Kawasaki disease [8]. The aim of this research work was to support prevention of these abnormalities.

**METHODOLOGY:**

This retrograde research work carried out from June 2014 to January 2020 in on Jinnah Hospital, Lahore the children with confirmed diagnosis of Kawasaki Disease. Ethical committee of the institute gave the permission to conduct this research work. All the patients having  $\leq 16$  years of age who fulfilled the standard for Kawasaki disease in accordance with guidelines of American Heart Association were the participants of this research work. Clinical criteria for complete disease of Kawasaki Disease included fever for  $\geq 5$  days and having some features among polymorphous rash, non-purulent conjunctivitis, enlargement of cervical lymph node, alterations in extremities and alterations in oral mucosa. Incomplete disease defined as the fever lasting for 5 days and having only two above mentioned clinical

criteria [5]. We reviewed the history of the patients regarding the demographic characteristics of the patients, examinations, ECG results, treatment method and complete detail of follow-up. Various examinations included count of complete blood and inflammatory markers as ESR (Erythrocyte Sedimentation Rate) and CRP (C - Reactive Protein).

Pediatric cardiologist performed the ECG of all the patients with the utilization of the same machines. Patients with the involvement of the coronary artery on initial ECG remained on a follow up of 12 months with regular ECG and examinations. We followed the criteria prescribed by the research committee of the Kawasaki Disease by ministry of health of government of Japan [9]. The treatment of all the patients carried out with Intravenous Immunoglobulin irrespective of presentation day, at dose of 2.0 gm/kg in separated doses, each managed over 6 hours, with proper check of Blood Pressure. All the patients obtained high aspirin dose of 80 to 100 mg/kg at diagnosis which was decreased to lower dose of antiplatelet (from 3 to 5 mg/kg per day) when children were without febrile illness for  $\geq 2$  days, except those patients who were present with anomalous findings of ECG. Outcome was on the basis of the availability and non-availability of the involvement of the coronary artery. The analysis of the data carried out on excels sheet. We presented the quantitative variables in averages and standard deviations. We expressed the qualitative variables in percentages. We used the Fisher exact test for the comparison of the categorical variables.

**RESULTS:**

25 patients who fulfilled the clinical standard for Kawasaki Disease diagnosis as supported by the ECG and laboratory findings were the participants of this research work. Majority of the patients were males with less than 60 year of age (Table-1). There prevalence of complete Kawasaki Disease was high as compared to incomplete Kawasaki disease (Table-1).

**Table-I: Demographics, Clinical and Laboratory Features of Children with Kawasaki Disease**

Characteristics		N (%), Mean, Range
Demographics	Total children	25 (100)
	Males	19 (76)
	Mean age in months	43, 4-150
	Age < 5 years	21 (84)
	Presented in winter months	13 (52)
Clinical features	Fever >5 days	20 (80)
	Maculopapular rash	20 (80)
	Oral mucosal changes	20 (80)
	Conjunctivitis	20 (80)
	Cervical lymphadenopathy	13 (52)
	Extremity changes (edema, peeling)	10 (40)
Laboratory features	White blood cell count ( $\times 10^3/\mu\text{L}$ )	18.6, 7.3-31.8
	Platelet count ( $\times 10^9/\mu\text{L}$ )	585, 100-1030
	Hemoglobin (gm/dl)	10.24, 7.6-12.8
	Erythrocyte Sedimentation Rate (mm/h)	59.5, 13-145
	C - Reactive Protein (mg/L)	118.7, 7-281

The most common clinical features are also present in Table-1 as maculopapular rash, fever, altered mucosa and conjunctivitis. The range of the duration of the febrile illness was 3 days to 3 weeks with average temperature of 102.50°C (100.0-105.0°C). Average interval between fever onset and diagnosis of Kawasaki Disease was 9 days. The investigations of laboratory stated a high count of white blood cells, count of platelets a, C - Reactive Protein and Erythrocyte Sedimentation Rate (Table-1). Majority of the children obtained Intravenous Immunoglobulin within ten days of fever (Table-2). There was no need of the second dose of Intravenous Immunoglobulin in any patient. Thirty two percent (n: 8) patients had abnormal findings of ECG initially (Table-2).

**Table-II: Echocardiographic Findings and Outcome of Children with Kawasaki Disease**

Outcomes		No (%), Range
Defervescence within 48 hours		25 (100)
Intravenous Immunoglobulin within 10 days		15 (60)
Initial echocardiography at diagnosis	Normal	17(68)
	Abnormal	8 (32)
Follow up echocardiography (2weeks)	Normal	17 (68)
	Abnormal	8 (32)
Abnormal echocardiographic features	Complete Kawasaki Disease	2 (25)
	Incomplete Kawasaki Disease	6 (75)
Patients with abnormal echocardiography showing CAAF	Coronary artery dilatation	5 (62.5)
	Coronary artery aneurysm	1 (12.5)
Characteristics of patients with abnormal echocardiography	Mean age in months	36 (4-120)
	Males	6 (75)
	Number of days of illness	7.8 (3-13)

Two children suffering from complete Kawasaki Disease obtained high dose of aspirin for 14 days whereas other obtained it for 21 days. This disparity in therapy was on the basis of high risk of the development of abnormalities of coronary arteries in the patients with incomplete Kawasaki disease. After that, there was continuation of dose of antiplatelet for 6-8 complete weeks. The patient present with complete Kawasaki Disease and abnormal ECG finding underwent use of aspirin for complete 8 weeks until there was clear finding of ECG. One patient suffering from complete Kawasaki Disease was present with history of aortic

stenosis. There was development of fusiform aneurysm of left coronary artery in 1 patient present with incomplete Kawasaki Disease. We continued aspirin to that patient. 3 other patients present with incomplete Kawasaki Disease found with the development of dilatations of coronary artery which was resolved by 6 months. Illness duration at the time of presentation was more than 5 days (Table-2). 72% patients completed the follow up of 6 months. Features of all the patients suffering from complete and incomplete Kawasaki Disease are present in Table-3 with comparison. There was significant difference in both groups.

**Table-III: Comparison of Children with Complete Versus Incomplete Kawasaki Disease**

Characteristics	Complete	Incomplete	P-value
	Kawasaki Disease (%)	Kawasaki Disease (%)	
Number of patients	18 (72)	7 (28)	
Number of male patients	12 (63)	7 (37)	0.1
Duration of fever (days)	8.8	10	0.06
Mean age (months)	57.2	22.7	0.04
Mean WBC count ( $\times 10^3/\mu\text{L}$ ) <sup>f</sup>	13.2	21.8	0.01
Mean platelet count ( $\times 10^9/\mu\text{L}$ )	404.7	477.5	0.05
Mean C - Reactive Protein (mg/L)	98.9	127.3	0.1
Number of patients with abnormal echo findings	2 (25)	6 (75)	0.001

### DISCUSSION:

There is no exact known prevalence of Kawasaki Disease in Pakistan. Singh concluded the prevalence of Kawasaki Disease in India as 4.50 per 100000 children with less than 15 years of age [7]. There is occurrence of Kawasaki Disease among children of Pakistan as elaborated by Alam [8]. Kawasaki Disease prevalence was high among male of this research work which is comparable to the findings of this research work [1, 10, 11]. Normally, Kawasaki Disease occurs in extremes of seasons of summer and winter [12]. In current research work we diagnosed 52% patients in winter season which is also the finding of other research work [13]. However, there was discovery of the peak prevalence in some other seasons [14,15]. The routine values of the laboratory as count of WBC, count of platelets, C - Reactive Protein and Erythrocyte Sedimentation Rate were same with

other research works [16,17,18]. The rate of occurrence of cardiac involvement in Kawasaki disease is different in various countries of the world as 6.20% in Thailand [19], 25.0% in Oman [20] and 33.0% in Turkey [21].

Sonobe stated the incidence of abnormality of the coronary artery in the patients of complete Kawasaki Disease as 14.20% and it was 18.40% in the patients with incomplete Kawasaki Disease [22]. Resistance to the treatment of Intravenous Immunoglobulin in initial stage have high risk of the involvement of coronary artery [23,24]. The findings of this research work showed that there were all male children suffering from incomplete Kawasaki Disease, from younger age group and had high count of WBC and platelets and they are more prone to develop the abnormalities of coronary arteries [25].

These findings are similar to various other research works.

### CONCLUSION:

There was presence of complete Kawasaki disease in 72% children of this research work. The abnormalities of coronary arteries were available in 1/3<sup>rd</sup> of our patients, at very younger age much common in the patients with incomplete Kawasaki disease but it got recovery in most of the patients. There should be diagnosis of Kawasaki Disease among children suffering from fever for prolonged durations.

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