

Acute Rheumatic Fever and Rheumatic Carditis in Children:

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Rheumatic Fever which was supposed to be rare or absent in tropical areas is now a well established entity in the tropics, (1, 2, 4, 10, 11, 12). Reports of Acute Rheumatic Fever and Rheumatic Heart Disease have consistently been published from undeveloped countries (economically underprivileged areas of Asia, Africa, South America and West Indies), (1, 2, 3, 7, 10, 11, 12, 13, 14, 15, 16), and a WHO report (21) said that Rheumatic Heart Disease tops the cardiovascular ailment in India. The composite picture which has emerged from the mass of these publications in the world medical literature is not very clear and conflicting conclusions have been drawn in various papers. Studies have been published which suggest that clinical expression of Rheumatic fever is milder in tropical climates than in temperate zones: (1,6,7, 10, 13, 16). Some have concluded that acute Rheumatic Fever is milder with less severe cardiac manifestations. Others have found milder manifestation of Acute Rheumatic arthritis with higher incidence and severity of cardiac manifestations, (11,12,14). Chronic Heart Disease was found to be more common than the incidence of Acute Rheumatic Fever (9,13). Others have reported no difference in the clinical picture of acute Rheumatic fever in the tropic and temperate zones (13, 15). What is impressive is the frequency and severity of carditis. Patients are delayed in reaching hospital as against arthritis. This is what is expected in the general level of poverty and malnutrition.

Secondly, the typical picture of migrating poly arthritis is not seen here often. Usually the patient comes with monoarthritis or arthralgia with Carditis, and other minor manifestations.

Rheumatic fever occurs most frequent in the lower-socio-economic group of population in the developing countries. It is a long term, chronic or recurring disease with serious social, emotional and economic implications for the patients and his family. Many services, Medical, Social, Educational and vocational may be needed and can seldom be financed by the family. In Pakistan the prevalence of Rheumatic Heart Disease is quite high, being 16% of the total cases admitted at the Cardiovascular Institute at Karachi and in the Paediatric ward the prevalence as 3.5% of the total admission. The prevalence has not decreased in the last 10 years.

A prospective study of Acute Rheumatic Fever and Rheumatic Heart Disease was carried out in Paediatric Deptt. (Unit-I) of the Jinnah Postgraduate Medical Centre, Karachi.

MATERIAL AND METHODS

This study comprises of 110 cases admitted between January 1972 and June, 1975. History was taken and the cases were examined in detail and Rheumatic Fever was diagnosed according to modified Jones Criteria (Jones 1955), with

additional qualifications suggested by Irvington House Group (Feinstein 1962).

A medical examination was done in each case at the time of admission and progress followed. Complete Blood Count, Urine Analysis, E.S.R., Throat Culture, and A.S.O. Titre studies were carried out at the time of admission. E.S.R. was repeated every week. X-Ray chest was done on all cases and repeated in case of carditis at 10-15 days interval. Cardio thoracic ratio was taken for evidence of enlargement. Standard 12 lead E.C.G.'s were done on all cases and repeated at fortnightly intervals in those with carditis. Weight of the patients was recorded and blood pressure taken daily. Temperature and pulse were taken 4 times a day.

The following treatment was carried out:- Bed rest, Penicillin, Aspirin, Steroids in cases with carditis and symptomatic treatment for cardiac failure and other complications. Appropriate diet, (Low Na and high K for CCF cases) Vitamins and Iron were given in standard dose.

Patient were treated in hospital for 12-16 weeks. If temperature, Pulse rate and ESR approached normal, the child was allowed increasing activity.

They were discharged from hospital when the clinical condition was better, the resting pulse rate was between 70-80/min and the ESR was normal. But unfortunately quite a few cases left against medical advise (8) and there were 2 deaths due to cardiac failure. Average duration of stay in hospital was 13 weeks.

They were followed in the special Rheumatic Clinic (Out Patients) at monthly intervals and given prophylactic penicillin. (Injection Benza-

thine penicillin, 6-12 lac Units depending on age weight of patient). Those who failed to report for prophylaxis were followed at home by Medical Social Workers and students from Social Welfare Department of Karachi University.

There is a teacher and occupational therapist in the Hospital who taught the long stay patients after the acute condition had improved.

RESULTS

Table 1: Rheumatic Fever and Rheumatic Carditis in Children 1973-75-78.

Total Admission	..	..	..	3120
Rheumatic Fever and Rheumatic Carditis	..	..	..	110
Prevalence	..	..	..	3.5%
Males	..	..	..	64
Females	..	..	..	46

The prevalence was 3.5% of the Paediatric admission.

Table 2: Study at Children's Hospital, JPMC, Karachi.
Rheumatic Fever in Children.

Age Incidence	No.	Percentage
5- 7 Years	25	22.7%
8- 9 "	20	18.1%
10-12 "	65	59.2%
	110	100.0%
Average Age	— 10.6 Year	

The age incidence is most in 10-12 years group (59.2%). Average age is 10.6 years. Weights

were all below 10th percentile of the Harvard standard. Sex incidence: there were more males than females.

Table 3: Duration of Symptoms.

<i>Duration</i>	<i>No.</i>	<i>Percent- age</i>
1-8 Weeks	60	54.5%
9-16	28	25.4%
> 16	22	20.1%
	110	100.0%

Average duration of Symptoms: 3.4 weeks
Table 3 shows that 54.5% had come within 8 weeks.

Table 4: Study at Children's Hospital, JPMC, Karachi.

Principal Manifestations of Actue Rheumatic Fever

Total Cases	100	
Significant Murmurs	71	64.5%
Pericarditis	9	8.1%
C.C.F.	30	27.2%
Subcut. Nodules	2	1.8%
Eryth. Marg.	3	2.7%
Chorea	15	13.6%
Fever	96	87.2%
Elevated Sedimentation Rate	78	70.9%
ASO Titre Oves 333 Units	62	56.3%
Poly. Arthritis	64	58.1%
Syndrome of Joint Pain Fever, and/or Elevated S.R., and elevated ASO Titre..	60	56.3%
Prolonged P-R Interval	4	3.6%
History of sore throat	65	59.0%
Throat Culture+ve	48	43.6%

Jones Major Criteria shows that 71 have come with Carditis (64.5%), 15 with Chorea (13.6%), 64 with Polyarthritits (58%), only 2 with Subcut. Nodules (1.8%) and 3 with Erythema marginatum. There were 60 cases (56.3%) with the syndrome of Joint Pains, Fever, Raised ESR and elevated ASO titres. ESR was raised in 78 cases (70.9%) and ASO Titres (> 333 Todd Units) in 50 ycases (45.4%). History of sore throat was present in 59% and throat culture was positive in 43.6%.

Table 5: Study at Children's Hospital, JPMC, Karachi.

Carditis

<i>Number of Attacks:</i>	<i>Total</i>	<i>Carditis</i>	<i>Percent- age</i>
1st Attack	57	39	55.0%
2nd Attack	32	17	53.1%
3rd or more Attack	21	15	71.4%
	110	71	100

Manifestations of Carditis

<i>Manifestation</i>	<i>No.</i>	<i>Percent- age</i>
Murmur	71	100.0%
Cardiomegaly	68	61.8%
C.C.F.	30	27.2%
Pericarditis	9	8.1%

Manifestations of Carditis:

Murmurs were present in all the cases (71), cardiomegaly in 68 cases, 9 had pericarditis and 30 cases had congestive cardiac failure (27.2%). Cardiac Manifestations were more in those who had come with 3 or more attacks. Almost 52% had come in their first attack, 29% with the second attack and 19.2% with 3rd attacks. Carditis was most (71.4%) in those with 3rd attacks.

Table 6: Study at Children's Hospital, JPMC, Karachi.

Clinical Manifestation of Patients with Cardiac Failure

	No.	Percentage
Murmurs only ..	17	56.6%
Murmurs+Pericarditis ..	9	30.0%
Murmurs+Nodules ..	2	6.6%
Murmurs+Erth. M. ..	2	6.6%
Accompanying ..	8	26.6%
	30	100 %

Showing clinical manifestations of patients with Cardiac Failure. 17 cases (56.6%) had Murmurs only while others had associated conditions with murmurs. All cases (30) had cardiomegaly.

Table 7: Study at Children's Hospital, JPMC, Karachi.
Influence of Number of Attacks on Cardiac Manifestations

Number of Attacks	Total	Cardio megaly(%)	CCF(%)	Pericar ditis(%)	Murmurs(%)
1st Attack ..	57	34 (59.7)	13 (30)	4 (10.2)	35 (61.4)
2nd Attack ..	32	20 (62.5)	8 (47)	5 (29.4)	21 (65.6)
3rd or more Attack ..	21	14 (66.5)	9 (60)	0	15 (71.4)
..	100	68	30	9	17

Cardiac Signs: Murmurs

Murmurs	No.	Percentage
Apical Systolic: ..	51	71.8%
Apical Systolic+Diastolic: ..	18	25.3%
Apical Systolic+Diastolic+A.I. ..	2	2.9%
	71	100 %

Table 8: Study at Children's Hospital, JPMC, Karachi.
Clinical Status at Time of Discharge
(12—16 Weeks)

Total number of cases with Carditis	..	..	..	..	=71	MI	= 34
L.A.M.A.	..	..	..	..	= 8	MS+MI	= 16
Deaths	..	..	..	..	= 2	MS+MI+	
Number with no murmur	..	..	..	..	= 9	AI	= 2
Number left for follow up:								=52

Average duration of stay in hospital=13 Weeks

Clinical Status at 1 Year follow-up

Number of Patients left in the series	..	..	..	..	=52	MI	= 29
Number of patients Followed up	..	..	..	..	=48	MS+MI	= 16
Number of patients lost to follow up	..	..	..	..	= 4	DEATHS	= 3
Number left for follow up							(90%)	=45

Table 9: Study at Children's Hospital, JPMC, Karachi.
Clinical Status at 2 Years Follow up

Number of patients left in the series	..	..	..	..	=45	MI	= 25
Number of patients follow up	..	..	..	..	=41	MS+MI	= 12
Number of patients lost to follow up:	..	..	..	..	= 4	DEATHS	= 4
Number of patients left for follow up							(64.2%)	=37

Clinical Status at 3 Years Follow up

Number of patients left in the series	..	..	..	..	=37	MI	= 22
Number of patients follow up	..	..	..	..	=34	MS+MI	= 10
Number of patients lost to follow up	..	..	..	..	= 3	DEATHS	= 2
Number of patients left for follow up							(58.9%)	=32

Though Cardiomegaly was present in almost 60% of the cases, it was present in 60-67% of cases with 2nd, 3rd or more attacks. Incidence of CCF was also more in those with over one attack. Pericarditis was present in 1st and 2nd attacks only and more in the later. Murmurs were Apical Systolic in 51 cases, Apical Systolic+ Apical Diastolic in 18 cases, and added Aortic Diastolic in 2 cases.

At time of discharge after 12-16 weeks treatment, 52 had improved and were left for follow up: there were 2 deaths and 8 had left against medical advise. 34 had apical systolic murmurs (M.I.), 16 had apical systolic and diastolic murmurs (M.S.+M.I.) and 2 had apical systolic and diastolic and Aortic Diastolic murmurs (M.S.+M.I.+A.I.).

Average duration of stay in hospital was 13 weeks. At 1 year follow up 45 were left as there were 3 deaths and 4 lost to follow up. Of these 29 had MI, 16 had MS+MI.

At 2 years follow up, 41 were left as 4 were lost to follow up, and further there were 4 deaths. There were 25 cases with MI, and 12 with MS+MI. At 3 years follow up there were 32 followed up, as 3 were lost to follow up and there were 2 deaths. Of these there were 22 with MI and 10 with MS+MI.

Table 10: Study at Children's Hospital, JPMC, Karachi.

Carditis Results of Follow up
(16 Weeks to 3 Years)

Total	LAMA	Deaths	Left for follow-up
52	11	9	32
	Better	Same	Worse
32	19	6	7

Complications of Carditis

Atrial Fibrillation	1
S.B.E.	2
C.C.F.	7
Relapses	14

Out of 52 cases left after treatment in hospital, 90% were followed up for one year, 64.2% for 2 years and 58.9% for 3 years. Of the Carditis cases, 19 were better, 6 same and 7 worse. The latter have been admitted again with repeated attacks of Cardiac Failure. Of the complications 1 had Atrial Fibrillation, 2 had SBE and 7 were left with CCF. 14 cases had relapses. Of the latter 11 were cases associated with Arthritis and 4 of these developed Carditis, and 2 cases of Chorea also developed Carditis.

DISCUSSION

Rheumatic Fever is as common in Pakistan as in other developing countries. It is a serious disease and carries a high mortality. This may be related to local virulence of streptococcal infection, over-crowding, malnutrition and various other factors prevailing in Pakistan.

The clinical picture is different from that seen in temperate climates. We have more cases with arthralgia and not the typical arthritis described in Textbooks. This corroborates the studies from Ceylon and India, that the initial attack is mild, hence the cases are given ambulatory treatment until they develop recurrences and come to hospital with gross cardiac lesions.

Rheumatic Fever is a problem in the poor socio-economic group. Due to long distances and lack of medical facilities, patients have irregular

prophylaxis leaving a large number with disability and poor prognoses.

A school survey at Karachi (17) in the 8-14 years age group showed Rheumatic Heart Disease incidence of 1.7/1000.

In (1968)—Billoo et al. (4)—carried out prophylaxis at Heart Clinic reported 100 cases showing clinical infection as:-

16.4% in regular group and
69.6% in irregular groups.

According to D'silva (7) the "incidence of Rheumatic Fever is low in the subcontinent and the disease runs a mild course and both cardiac complications and mortality are less". Though this study corresponds with the first part that that incidence is low, but regarding cardiac complications, 65% had obvious signs of severe carditis in Karachi. According to Vaishnava and Webb (20) from S. India out of 166 cases of Juvenile Rheumatism, the heart was involved in 144 cases, i.e., in almost 87% of cases, which is more than in this study.

In the study by Shauket et al., (18) it has been pointed out that what is most disturbing is the frequency and severity of cardiac lesions. Of course that study includes the adults as well.

It has also been found here that 65% had carditis, which is a high percentage and causes grave concern, as these patients are too poor to carry out the advice and treatment recommended.

Rheumatic Fever disease is a public health problem and its various aspects have not been assessed. Rheumatic fever is preventable and every effort should be made to prevent it.

Widespread propaganda must be done on radio and television to impress the public of the importance of preventive measures and the continuation of prophylactic penicillin for prolonged periods once an attack has occurred.

In Pakistan familial occurrence is not common. In order to reduce the incidence of Rheumatic Fever special clinics must be established in all hospitals and general practitioners should be made aware of this problem, and instructions to give adequate treatment of streptococcal infections in the early stages, and prophylactic penicillin to those who have had an attack of Rheumatic Fever to prevent relapses. There should be a community wide programme for prevention and prophylaxis, involving health agencies, school health department, voluntary groups and committee organised by the medical association.

SUMMARY

Acute Rheumatic Fever formed 3.5% of the total paediatric admissions at the JPMC during this study. Average age was 10.6 years with 64% males. Average duration of symptoms prior to admission was 3.4 weeks and average duration until all evidence of activity subsided was 13 weeks. In-hospital mortality was 1.8% and a 3 year follow-up showed an average mortality of 7.3% per year in the carditis patient available for follow-up.

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