

Pattern of Acute Rheumatic Fever in a Local Teaching Hospital

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Summary

Hospital records of children admitted to the department of Paediatrics, University Hospital, Kuala Lumpur, from January 1981 to December 1990, who were diagnosed to have acute rheumatic fever (ARF) were studied. 134 children satisfied the Jones' modified criteria, thus giving a hospital incidence of 21.2/100,000 paediatric admission per year, of which incidence of first attack was 15.8/100,000 per year and recurrent attack was 5.38/100,000 per year. The M:F ratio is 1.39:1. Majority of cases occur in the 6-11 years age group with 6 cases encountered below the age of 5. The Indians had a higher relative risk to develop both the first acute attack as well as recurrences with a relative risk of 2.4 and 4.10 respectively as compared to the Malays. Majority of the patients, irrespective of the ethnic group, came from families with low income.

Key Word: Acute rheumatic fever

Introduction

Acute rheumatic fever (ARF) remains a major public health problem in Malaysia as in other developing countries in the world. Like in many other parts of the world, rheumatic fever (RF) is not a reportable disease, hence definite figures on its general incidence are not available. An initial attempt here is made to look at the pattern of disease amongst the paediatric age group seen at the University Hospital, Kuala Lumpur, Malaysia, over a ten year period spanning January 1981 to December 1990. The data obtained here is not a true reflection of the general population at large because, being a referral centre, it gets more than its share of the cases, thus creating an apparently higher incidence rate. The hospital is situated in the Klang Valley where the country's population density is at its maximum and all the various different socio-economic classes of population are represented. The aims of the study were to look at

- its sex, age group and ethnic group distributions
- and its relationship to economic status.

Materials and Methods

This is a retrospective study to include all patients admitted to the Department of Paediatrics, University Hospital, Kuala Lumpur from January 1981 to December 1990. Those patients with a diagnosis of rheumatic fever were reviewed with cross references to the outpatient unit. The Jones' modified criteria¹ as shown in Table I were used in the diagnosis of the cases.

It is the department's policy that all patients with suspected acute rheumatic fever are admitted and worked up till the diagnosis is proven otherwise. Demographic and socio-economic data, medical and laboratory results were reviewed in all cases. Patients who did not meet the Jones' criteria for acute rheumatic fever were excluded. The hospital medical records department provided the hospital admissions statistics.

the incidence of ARF

Table I
Jones' modified criteria for acute rheumatic fever

Major Manifestations	Minor Manifestations
Carditis	previous rheumatic fever
Polyarthritis	arthralgia
Chorea	fever
Erythema marginatum	elevated ESR, C - reactive protein
Subcutaneous nodules	ECG changes

The presence of 2 major criteria or 1 major and 2 minor criteria indicates a high probability of acute rheumatic fever if it is supported by evidence of previous streptococcal infection.

Results

One hundred and thirty four acute rheumatic fever patients with acute attacks were identified during the 10 year period from January 1981 to December 1990. The incidence of acute rheumatic fever attacks was 21.2 per 100,000 paediatric admissions per year. Out of these, 34 were recurrent attacks occurring in 20 patients. Incidence of first acute attacks was 15.8 per 100,000 hospitalised children per year as compared to 5.4 recurrent attacks per 100,000 hospitalised children per year (Table II).

Table II
Incidence of ARF in the different subgroups of patients

	No. of patients	Incidence*
Total no. of acute attacks	134	21.2
Total no. of first attacks	100	15.8
Total no. of recurrent attacks	34	5.4
Total no. of patients recurrent attacks	20	3.2

* per 100,000 paediatric admission per year

There were 78 males and 56 females with acute rheumatic fever giving a ratio of 1.4 M : 1 F. Even if first attacks only were to be considered, the sex occurrence was still 1.4 M : 1 F (59 males versus 41 females). Amongst the 20 patients who developed acute recurrent attacks, 11 were males and 9 were females with a ratio of 1.2 M : 1 F (Table III).

Table III
Sex occurrence in the different acute rheumatic fever subgroups

	Male	Female	Total	Ratio
No. of acute attacks	78	56	134	1.5:1
No. of first acute attacks (patients)	59	41	100	1.4:1
No. of recurrent attacks	19	15	34	1.3:1
No. of patient recurrent attacks	11	9	20	1.2:1

Using statistical analysis for our data, the sex ratio difference is not statistically significant ($p > 0.2 < 0.3$) compared with the hospital paediatric unit admission of 1.14 M: 1 F.

The frequency distribution of the patients according to age is as shown in Figure 1 with a peak occurrence in the age group of 11 to 12 years. More than 63% of acute rheumatic attacks occur between the ages of 6 to 11 years and more than 85% below the age of 12. In the youngest age group of less than 5 years, 2 of the patients were only 4 years of age. The age distribution of first acute rheumatic attacks was similar to that of the total acute rheumatic attacks with the majority (76%) in the 6-11 years age group and 82% below the age group of 12.

There is a preponderance of Indians in the occurrence of rheumatic fever. The racial distribution of the acute rheumatic attacks is as shown in Table IV.

Indians were 2.4 times more likely to have an attack and "Others" 3.3 times more likely. Using the chi-

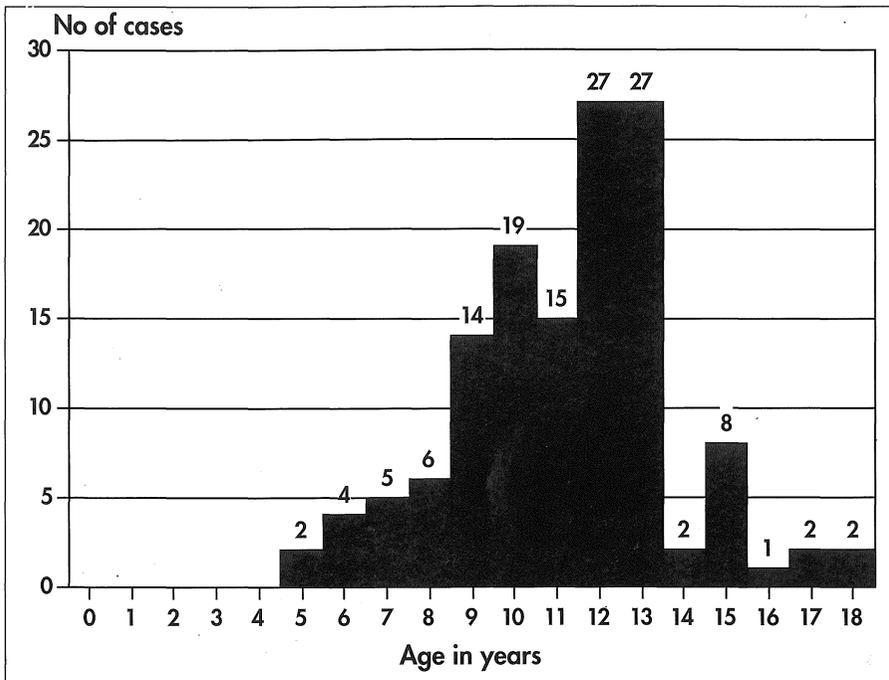


Fig. 1: Age distributions of children with acute rheumatic fever attacks

Table IV
Acute rheumatic fever in children in University Hospital by ethnic group from January 1981 to December 1990

Ethnic group	Total Paediatric Admissions		Rheumatic fever		Relative	P value
	Number	Percentage	Cases	Incidence*	Risk+	
Malay	31471	49.8%	46	14.6	1	-
Chinese	16333	25.8%	33	20.0	1.4	> 0.2
Indian	14968	23.7%	53	35.4	2.4	< .01
Others	418	0.7%	2	47.8	3.3	< .01
TOTAL	63190	100.0%	134	21.2		

* number of children hospitalised with acute rheumatic fever per 100,000 children admitted per year.

+ as compared to Malays.

squared test the probability that the difference between Malays and Indians arising by chance is 5.15 ($p < .01$) and between Malays and "Others" the value is 9.4 ($p < .01$). There was no significant difference in the incidence of acute rheumatic fever between Malays and Chinese ($p > 0.2$).

The group of patients with recurrent rheumatic fever attacks were also analysed: There were 20 patients with a total of 54 acute attacks of which 34 were recurrent attacks. The racial distribution and frequency of attacks are as shown in Table V. Similarly an ethnic preponderance of Indians in the incidence of recurrent

attacks was noted. The Chinese had a relatively low incidence of recurrent attacks.

The Indians were 4 times more likely to develop recurrences as compared to the Malays and 11 times more likely as compared to the Chinese. In general, rheumatic fever tends to be predominant in the economically depressed group in the identified population rather than due to genetic differences in the different population subsets. A majority of our patients with rheumatic fever, irrespective of their ethnic origin, had a total monthly family income of less than RM500.00 (see Table VI, VII). Seventy-

three per cent of acute rheumatic attacks, 70% patients with first attacks, and 85% of patients with recurrent attacks were from this group with income of less than RM500.00. Interestingly only 57% of the Chinese family had a monthly income of less than RM500.00.

The yearly occurrence of acute rheumatic fever attacks over the last 10 years seemed to show a decline both in the number of acute rheumatic fever attacks as well as in the number of new patients (Fig. 2). In 1990 there were only 4 new cases as compared to 22 new cases in 1981.

Table V
Distribution of patients with recurrent attacks by ethnic group

Ethnic group	Total No. patient	Total No. acute attacks	Total No. recurrent attacks	Incidence recurrent attacks#	Relative Risk*
Malay	8	19	11	3.5	1
Chinese	2	4	2	1.2	0.3
Indian	10	31	0	14.0	4.1
Others	0	0	0	0	0
TOTAL	20	54	34	5.38	

per 100,000 children admitted per year

* as compared to Malays

Table VI
Table showing the economic status of the patients

Family income M\$ per month	Acute Rheumatic Total No.	Attacks %	Patients		No of patients with recurrent attacks	Attacks %
			No.	%		
< 200	20	14.9	11	11	4	20.0
201 - 500	79	59.0	59	59	13	65.0
501 - 1000	18	13.4	13	13	3	15.0
> 1001	8	6.9	8	8	0	0.0
Unknown	9	6.7	9	9	0	0.0
TOTAL	134	100.0	100	100	20	100.0

Table VII
Income grouping in relation to the ethnic group

Family income M\$ per month	Ethnic Group							
	Malay Ac attacks		Chinese Ac attacks		Indian Ac attacks		Others Ac attacks	
	No.	%	No.	%	No.	%	No.	%
< 200	4	8.7	1	3.0	14	26.4	1	50.0
201 - 500	30	65.2	18	54.5	31	58.5	0	0.0
501 - 1000	3	6.5	7	21.2	8	15.1	0	0.0
> 1000	5	10.9	2	6.1	0	0.0	0	0.0
Unknown	4	8.7	5	15.1	0	0.0	0	0.0
TOTAL	46	100	5	99.9	0	0.0	0	0.0

Discussion

The incidence of rheumatic fever, has been declining in the developed countries like Japan², Scandinavian countries³ and the United States of America^{4,5}.

In the Scandinavian countries over the last century the incidence has dramatically dropped from 200 to 11/100,000 cases whereas the annual incidence of

rheumatic fever in hospitals in Connecticut USA, has dropped from 12.3 in the period 1934-1938 to 2.9/100,00 in the 1968 to 1972 period⁶. However, interestingly, this declining incidence of rheumatic fever in the US is not seen in the selected subgroups of black and Puerto Rican children⁷ despite being in the same neighbourhood as those in the low risk population. In another part of the world e.g. the Asian region wherever data are available eg India, Indonesia, Thailand² and Africa (Nigeria)⁸ the disease still poses a great problem.

The incidence of acute rheumatic fever in Thailand for a 5 year period from 1964-1968 ranges from 7.3 to 31.78/10,000 hospital admissions (i.e 73 to 317.8/100,000 hospital admissions) compared to our present study of 21.2/100,00 hospital admissions. For that 4 year period they saw a total of 1128 cases of rheumatic fever. In an Indonesian hospital for a 4 year period from 1969-1972 they saw 172 patients with an average of 43 cases per year. Our largest number of new patients in a single year was only 22.

The ethnic differences in the incidence rate is very striking. The number of cases of rheumatic fever and the relative risk of getting the disease is significantly higher in Indians. Could this be purely attributed to different genetic susceptibilities? The high number of

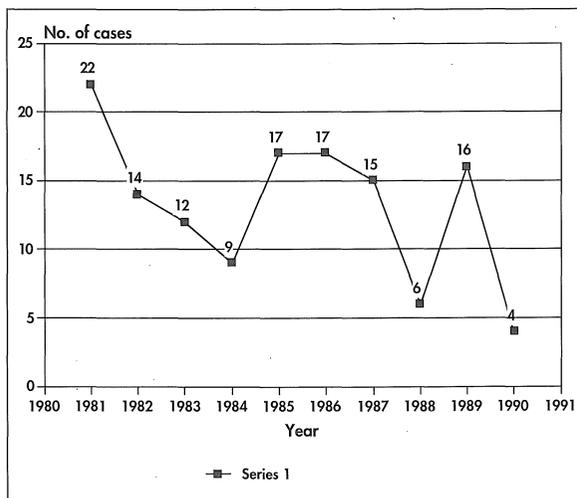


Fig. 2: Distributions of ARF attacks during the years 1981-1990.

children regardless of the ethnic group from the low socio-economic backgrounds (family income < RM500/month) seemed to be at greater risk of rheumatic fever. Thus it is likely that the diversity of ethnic group susceptibility is not genetic but rather socio-economic.

Ethnic groups in the United States of America that have an increased susceptibility of acquiring rheumatic fever include the Navajo Indians, Polynesians and the blacks.

The United States of America does have immigrants from the Indian subcontinent but the studies that were available did not identify this subgroup as a susceptible subgroup. Marked progress in Malaysia's socio-economic conditions over the last decade had facilitated access to medical treatment and this may have contributed to the declining trend of acute rheumatic fever.

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