

Pattern of Cardiac Illness in Children at Zewditu Memorial Hospital.

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Abstract

Reports of the pattern of childhood cardiac illness , in this country, has shown that rheumatic heart disease is predominant. Congenital and non rheumatic acquired heart disease, remain the second and the third respectively.

The objectives are to determine pattern of childhood cardiac illness in a hospital setting at Addis Ababa. A retrospective descriptive study of children with known cardiac problem at pediatric cardiac clinic of Zewditu memorial hospital. There was a total of 57 cases with mean age of 8.7 and median age of 10 years were described. Rheumatic and congenital heart disease was found in 56.1% (33/57) and 36.8% (21/57) of the study group respectively. Mitral valve was affected in 96.9%(32/33) of the rheumatic cases, while ventricular septal defect is the most common cardiac lesion among the congenital heart disease cases 42.8% (9/21). In conclusion the pattern of cardiac disease in children still remains the same reflecting rheumatic heart disease dominance in a hospital setting. Effective primary and secondary prevention of rheumatic fever is recommended.

Introduction

In countries with poor socioeconomic status, where crowding and poor access to medical care is common the pattern of heart disease in children will not be similar to that of developed countries. The current trend in the developed countries showed that rheumatic heart disease is declining where as the prevalence of congenital heart disease is increasing (1). The reason for this change may be an improved socio economic condition, better housing and better access to medical care. On the other hand attended deliveries with routine screening of newborns for possible congenital anomalies have increased the detection of children with congenital heart diseases. In Ethiopia few studies have been done showing that rheumatic heart disease is the dominant cardiac problem in children. Abegaze in 1988 reported 63.1% rheumatic heart disease and 29.0% congenital heart disease cases (2). Studies from other African countries have also shown higher rate of the prevalence of rheumatic heart disease (3,4). Tewodros et al from Jimma university demonstrated high prevalence of acquired heart disease (70%) where 74.5% of which is due to rheumatic heart disease(5). Report from teaching hospital in Addis Ababa showed that rheumatic heart disease accounted for 50% of cardiac admissions(6). On the other hand studies from some developing countries like Pakistan, Malaysia, Afghanistan and Sudan have shown an increment in the incidence of congenital heart disease which could be attributed to the improvement in the health delivery system and socioeconomic status(1,7,8). In Ethiopia there are various initiatives to bring social development, however, the influence of poor living condition on health of the people is still prevailing. Therefore, the pattern of childhood cardiac disease in this country may still be similar to that of other developing countries. In the present study we will

describe pattern of childhood cardiac disease in a hospital setting at Addis Ababa. The objectives are to describe pattern of childhood cardiac illness in a hospital setting at Addis Ababa.

Materials and method

Zewditu memorial hospital is Addis Ababa; it is one of the referral hospitals in the city. Patients come to the hospital referred from various health centers and different part of the country. In the hospital compound is located Children Heart Fund Ethiopia(CHFE), an organization that identify severely affected cases and send abroad for definitive surgery. The pediatric cardiac clinic of the hospital works in collaboration with the organization. Thus cardiac patients who attends the CHFE at the same time having regular follow up at the clinic were studied.

It is a retrospective descriptive data analysis is used to describe clinical and demographic data of patients. Data was collected using structured formats including socio-demographic and clinical data. Patients chart during 1997-1999 was used as a source of data. Additional information was asked from parents or attendants when necessary.

Growth status (weight and height) of patients were assessed using the national center for health statistics (NCHS) graph(10). Functional status of patients were assessed with the New York heart Association's classification (NYHA) (11).

Congenital heart disease is defined as structural abnormality of the heart evidenced by characteristic clinical, chest x-ray and/or echocardiographic findings (12, 13). Acquired non-rheumatic heart disease was considered when no evidence of rheumatic heart disease or Congenital heart disease is obtained.

In all patients' diagnosis were confirmed by 2D-echocardiography performed by experienced cardiologist. The diagnosis of rheumatic heart disease and rheumatic fever was based on carditis and fulfillment of John's criteria (9). The economic status of cases were assessed by the family's capacity to cover the hospital expenses. Frequent absence from school were considered as inconsistent school attendance (more than one third of the month). Data were entered and analyzed using EPI info 2000 version. Statistical differences were computed using 95% confidence interval, with p-value <0.001.

Result:

There was a total of 57 cases with mean age of 8.7 years and median age of 10 years respectively. Age ranged from 2 months to 14 years. Females accounted for 69.6% making the F: M ratio 2.3:1. Average family size in Congenital heart disease case is 5.2 and for rheumatic heart disease 5.9. Rheumatic heart diseases occurred in 56.1% (33/57) of cases, while congenital heart disease occurred in 36.8% (21/57) of cases. Three out of 57 (5.3%) of cases were due to Cardiomyopathy secondary to HIV infection.

Mitral valve was the most commonly involved valve in the rheumatic diseases processes (96.9%). Mitral stenosis, both pure and combined form occurred in the 3rd of the cases. Tricuspid regurgitation occurred in one-fourth of cases, mainly secondary to pulmonary hypertension and severe form of mitral regurgitation and mitral stenosis. More than three fourth of cases of rheumatic heart disease occurred in children above ten years of age.

Ventricular septal defect (VSD) is the most common cardiac lesions among the congenital heart disease cases 42.8% (9/21) followed by ASD 9.5% (2/21), PDA 9.5% (2/21) and CAVC 9.5% (2/21), TOF 9.5% (2/21), PS 4.8% (1/21), d-TGA 4.8% (1/21). We found 2 cases of congenital anomaly: Spastic diplegia with rheumatic heart disease having MR+MS+TR and Down's syndrome with Endocardial cushion defect. The following clinical presentation were recorded: palpitation in 25%, cough in 21.4%, Easy fatigability in 16%, Shortness of breath in 12.5%, and all others in 25.0% of cases. The above presenting symptoms were more apparent in patients older than 5 years (75.4%) than the under fives (22.8%). Weight measurement were obtained in 96.5% of cases. Wasting was observed in 49% (27/55) cases. Height measurement was obtained in 34 cases, where in 29.4% (10/34) of them stunting occurred. Both wasting and stunting in the same individual case occurred in 20.6% (7/34) cases. According to the New York heart association classification (12), functional status were: class I in 23.0%, class II in 25%, class III in 37.7%, class IV in 14.3%. Forty one percent (23/57) of the cases were unable to cover their hospital expenses.

Positive family history of cardiac disease were found in 7 of the 49 cases where information is available (14.3%). Consistent school attendance is exhibited in only 31.4% of the cases. The rest either discontinued (14.3%) or have frequent school absence (51.4%).

Table 1: Frequency of heart disease by sex and age, Zewditu memorial hospital pediatric cardiac clinic 1997-99 EC.

Variables	AHD (n =36)	CHD (n =21)	Total (n =57)
Age in year			
0-4			
Male=	0	4	4
Female=	0	9	9
5-9			
Male=	3	2	5
Female =	5	3	8
10-14			
Male=	7	1	8
Female =		2	23
Sex			
Male	10(45.8%)	7(41.2%)	17(29.8%)
Female	26(29.7%)	14(35%)	40(70.2%)
			57 (100%)

Table2: Frequency of heart disease Zewditu memorial hospital pediatric cardiac clinic 1997-1999 EC.

Type of heart disease	No. of patients	Relative frequency
CHD	21	36.8%
AHD-rheumatic	32	56.1%
AHD-non rheumatic	3	5.3%
Carditis with no residue	1	1.8%
	Total 57	100%

Table 3: Frequency of valvular involvement in rheumatic heart disease at pediatric cardiac clinic of Zewditu memorial hospital 1997-99 EC.

Type of valve involved	M	F	Total	
			No.	%
MR	0	9	9	28.1%
MS	0	3	3	9.3%
MR, MS	3	2	5	15.6%
MR, MS, AR	0	3	3	9.3%
MR, AR	4	0	4	12.5%
MR, AR, TR	1	7	8	25%
Total	8	24	32	100 %

Table 4: Frequency of congenital heart diseases, Zewditu hospital pediatric cardiac clinic 1997-99 EC.

Type of cardiac lesions	M	F	Total	
			No.	%
VSD	3	6	9	42.8%
ASD	0	2	2	9.5%
PDA	1	1	2	9.5%
CAV-channel	0	2	2	9.5%
PS	0	1	1	4.8%
PS,MR	0	1	1	4.8%
MR	0	1	1	4.8%
TOF	2	0	2	9.5%
TGA	1	0	1	4.8%
	7	14	21	100%

Table 5: Growth pattern in children with cardiac disease at Zewditu Hospital 1997-1999Etc.

	Acquired rheumatic heart disease				Congenital heart disease				
	0-4year	5-9year	10-14y	Total	0-4year	5-9year	10-14year	Total	Grand total
Wt.<5 th Centile		2	10	12	3	2	1	6	20
Ht.<5 th centile		1	1	2	1			1	3
Wt. and Ht.<5 th Centile		2	3	5	2			2	7

NB.The total number of times weight affected is 20+7= 27,while the total number of times height affected is 3+7=10.

Discussion

Sex and age distribution in the present study has been compared with other similar studies and it was found to be comparable. Seventy eight percent of rheumatic heart disease occurred above the age of 10 years. This occurrence goes with the incidence of streptococcal throat infection. The same pattern has been reported by Tewodros et al (5). B. Abegaz reported a mean age of 6.5 and 11.4 year for congenital heart disease and rheumatic heart disease respectively(2). Acquired heart disease was found in 63.2% (36/57) of cases, rheumatic heart disease being the most common(91.7%)(see table I). Global reports have shown that rheumatic heart disease is the commonest childhood cardiac disease in the developing countries (3, 4). The former two studies reported 63.1% and 74.5% respectively (2,5). In another study done in Addis by Daniel et al, occurred in 59% of the cases (14).Desta D from Jimma University reported a 49.4% rheumatic and 35% congenital heart disease pattern (15).

The high prevalence of group a streptococcal (GAS) throat infection in this country may explain the high prevalence of rheumatic heart disease. Ninety-eight percent of the rheumatic cases in the current study had advanced residual cardiac lesions and there was only one case of carditis with out residual lesions. The reason for this may be, patients having repeated streptococcal throat infection secondary to in-adequate prophylaxis or Patients looked for medical care after being compromised. In fact this may be true as these are group of severe cases who were referred to the children heart fund Ethiopia (Zewditu hospital), anticipating surgical intervention.

Mitral valve was the most common valve involved in the present study 96.9% (32/33). This has also been the finding of the former studies (2, 4). Mitral valve being in the high velocity chamber, it is facing higher blood turbulence and be

damaged easily, that is why it is frequently affected in rheumatic heart diseases. Pure Mitral stenosis occurred in 9.3% of cases. Others reported 6.8% and 5.3% (2, 5). Melka A. in his population based study reported 21.9% (16). The fact that our result is higher compared to the former two studies may be because of the nature of the cases as stated above. The prevalence of congenital heart disease in this study was 36.8 % (21/57). This relatively low prevalence is comparable with findings from other studies. B. Abegaz reported a 29.0% (2), Tewodros et al a 30% (5), Desta D. a 35%(15) and Daniel et al a 35.9% of congenital heart disease case(14). However, these findings have not been consistent with reports from other developing countries. For example a report from Sudan revealed more than half of their cases are congenital heart disease and they have attributed this to improved living standards and better medical care (1).Ventricular septal defect (VSD) is the commonest lesions detected in the present study. This has been the common finding in most studies sited above (1, 2, 5 , 14). The common congenital heart disease cases are listed in table II. However because of the small number of the cases, one may not say much about the pattern of occurrence.

With the reservation that questionnaires and anthropometric measurements were not properly standardized and family history of heart disease were not confirmed by physical examination, this study showed the same pattern of cardiac disease in children with rheumatic heart disease dominance. The female preponderance remains an explained. Improvement in socioeconomic condition, effective primary and secondary prevention of rheumatic Fever and infective endocarditic with increased attended delivery coupled with routine neonatal screening for congenital anomalies is the recommendation of this study.

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