

ORIGINAL ARTICLES

Screening of School Children for Operable Congenital Heart Diseases in Rural Area

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Abstract

A random sample of 15,500 school going children in the age group of 6-16 years from public and private schools of Bhaluka & Gaffargaon were screened for the prevalence of operable congenital heart diseases [CHD] during a period of 12 months.

Congenital heart diseases were diagnosed preliminary on the basis of clinical history and or clinical examination & confirmed by supportive investigations. Out of examined sample 350 were found suffering from CHD, giving an overall prevalence of 22.25 per 1000 of children far greater than that of the figure recorded in available literatures for other countries.

The prevalence rate was higher in girls than that of boys in the present study which may indicate a negligence of care taking towards female children in family. In consistent, children from lower income group had a higher prevalence rate compared to their middle income group counterparts. One hundred sixty children were found to be suffering from definite operable CHD giving a prevalence of 10.32 per 1000, where again girls were the main victims.

Atrial septal defect was the commonest lesion with a prevalence of 9.6 per 1000 followed by ventricular septal defect with a prevalence of 5.8 per 1000 children. Eight cases had a family history of CHD. History of rheumatic fever and or rheumatic heart disease were found to have significant prevalence among cases with CHD as compared to children without CHD.

The finding of present survey suggest the need of large scale screening of apparently healthy children for CHD and family members of those suffering from CHD and that special attention to be paid to the occurrence of rheumatic fever or rheumatic heart disease in cases of CHD.

Key words- School going children, operable congenital heart disease, rural area.

Introduction:

Congenital heart disease is a general term used to describe abnormalities of the heart or great vessels that are present from birth. Going by figure quoted in western countries it has been generally accepted that approximately 1% babies are born with congenital cardiac malformations in case of full term births. The frequency may be more higher in our children as it has been suggested in the available literatures.^{1,2,3} Although some of them produce manifestations soon after birth, others do not necessarily become evident until late childhood or even as late as adulthood [Atrial septal defect, coarctation of aorta etc.]

The number of adult with CHD is increasing rapidly as a direct result of advances in diagnostic methods and in the medical & surgical care of infants. However now with

modern cardiac surgery more than 85% of the estimated 25000 infants born annually with CHD are likely to reach adulthood.⁴ Most of the survivors have malformations that can be corrected by currently available surgical techniques. Thus out of 10 babies of the 1000 born with CHD at least 8 can be expected to survive and to live normal life. Projecting on western figures on our population, for a population of 140 millions there would be chance of approximately 1.4 millions people who would have been born with CHD. Under current situation of cardiac surgery in our country it is possible to offer palliative or corrective cardiac surgery to these patient in order to decrease children morbidity and mortality related to CHD.

Despite the fact that almost all of the common CHD are easy to detect by means of simple and widely available

measurement device, majority of the patient or parents remain unaware of their condition during the early stages. Most children are free of symptoms for many years and the condition is often detected at routine clinical examination or at examination for some unconnected reasons. Even those with serious malformation are often described as the wildest member of the family by parents who find it difficult to believe or to accept that there is anything wrong with their child's heart.

In most cases an accurate diagnosis can be made at the bedside simple by careful clinical examination supplemented by simple ancillary tests such as X-Rays, ECG & Echocardiography. In order to decrease the late fate of CHD, immense strides have been made in the diagnosis and therapy of congenital heart defects allowing extended survival for many children.^{5,6} Most forms are now amenable to surgical repair with good results. Timely Cardiac Surgery promises almost normal longevity to these children.

Thus there is a clear need for community based survey to determine the prevalence of CHD for a particular community or segment in order to make an exact appraisal of the magnitude of the problem. The present communication is aimed as first step in this direction. Then the present study is designed to determine the prevalence of CHD in school children of rural area.

Materials & Methods:

A cross sectional study was carried out on 15500 school children aged 6 – 16 years to find the prevalence rate of CHD among the apparently healthy rural school children. The selection of subjects was on the basis of random sampling from the present student [on the day of examination] of 40 public school of Bhaluka & Gafargoan. These schools are usually to the educational needs of the lower and middle class families of these Upa-Zilla (In respect of income). Low income group whose monthly income is less than 3000/=taka and middle class whose income is 3000/= to 5000/=taka per month.

As it has been predicted that CHD is prevalent among the underprivileged population, so school going children from affluent families whose monthly income is more than 5000/= taka, were excluded from the present study. The social status of the family was assessed by the occupation of the parents or guardians, monthly income of the family, family members, types of residence etc.

The subjects were all apparently normal and healthy school going children. The age of the subject was determined from their date of birth recorded in the school register and

then it was rounded off to the nearest whole number. Standing height and weight were measured by standard anthropometric rod and weighting machine respectively.

An interview sheet was filled up by direct interview with the student and or guardians, when necessary on a pre appointed date and time. History of rheumatic fever, recurrent respiratory tract infection and other complaints related to CHD were asked and recorded, in order to socioeconomic status. A leaflet was printed in simple Bengali language, explaining the aims and objectives of this work to motivate the parents. The benefit of such work was emphasized through lectures and demonstrations in order to ensure more participation. Assurance was given to the parents or guardian that if desired the findings could be kept confidential.

A complete physical examination was carried by specialist. The children with suspected CHD was advised to report for further examination and necessary investigations in BSMMU to confirm the diagnosis and then treatment. In reported cases, appropriate surgical intervention was carried out after confirmation of the diagnosis.

Results & Observations:

A total number of 15700 school going children in the age group of 6 – 16 years were primarily screened for the determination of the prevalence rate of operable CHD. But, during final processing of the data the record of 250 was not considered as most of those had incomplete information. Thus finally 15500 school children were, where boys were 8000 and girls were 7500, were assessed.

The distribution of the population according to their sex and socio-economic class in different age groups was shown in Table-I.

Out of the examined sample 350 were found to have CHD, giving prevalence rate of 22.25 per 1000 [Table-II].

The prevalence of CHD diagnosed preliminary by history and clinical examination in the present study was found to be significantly higher in female than in male children Table -2. at the end of appropriate examination for confirmation of the diagnosis still the girls were major victims, Table-III.

Atrial septal defect was the commonest lesion 0.96% with a prevalence of 9.6 per 1000 followed by ventricular septal defect 0.58% with a prevalence of 5.8 per 1000. 18 cases had a family history of CHD. History of rheumatic fever and or rheumatic heart disease were found to have significant prevalence among cases with CHD 15.25% as compared to children without CHD 2%.

Incidence of other operable congenital heart disease was very negligible.

Table-I
Study population

Age Groups in Years	Male [n=8000]		Female [n=7500]	
	Low income group	Middle income group	Low income group	Middle income group
6-8	962	1018	973	1135
9-11	987	1005	1108	882
12-14	783	1067	808	672
15-16	1213	965	1037	885
6-16	3945	4055	3925	3575

*Low income group whose monthly income less than 3000taka/month and middle class whose monthly income 3000-5000 taka(Guardian's income)

Table-I shows the distribution of the population according to their sex and socio-economic class in different age groups

Table-II
Cardiac problems diagnosed by history & clinical examination

Age Groups in Years	Male [n=140]		Female [n=210]	
	Low income group	Middle income group	Low income group	Middle income group
6-8	25	8	40	22
9-11	32	5	45	25
12-14	20	12	30	8
15-16	30	7	27	13
6-16	107	33	132	68

Table -2 showing prevalence of CHD. Out of the examined sample 350 were found to have CHD, giving prevalence rate of 22.25 per 1000. Low income group monthly income less than 3000/= taka & middle income group monthly income 3000-5000/= taka per month.

Table-III
Common defects [n=140]

Diseases	Male [n=140]	Female [n=210]	Total
ASD	62	88	150
VSD	35	55	90
PDA	25	35	60
TOF	12	18	30
Coarctation	2	3	5
Others	3	2	5

Table-III showing the disease pattern in respect of sex

Discussion:

A total number of 15700 school going children in the age group of 6-16 years were primarily screened for the determination of the prevalence rate of operable CHD. For a conclusive information it was better to include more school students. But, during final processing of the data

the record of 250 was not considered as most of those had incomplete information. Thus finally 15500 school children were, where boys were 8000 and girls were 7500, were assessed.

The prevalence rate was clearly higher than other studies carried out in different countries.⁷⁻¹² Although going by figure quoted in western countries it has been generally accepted that approximately 10 per 1000 babies are born with CHD incase of full term births.¹ Other reported a relatively lower prevalence form different countires.⁷⁻¹² From India it has been reported a prevalence of CHD among their school going children of only 2.25 per 1000 child.⁷

But in one community based study the investigators reported higher prevalence rate of CHD among Delhi children of 4.2 per 1000 of children.¹² in south Africa the prevalence of CHD among school children accounted for only 1.01 per 1000 child.¹⁰⁻¹⁵

In consistent with the present finding Thakir et al⁷ also observed a higher prevalence of CHD among female school

going children in the age group of 5-15 years in Shimla hills, India. In contrast there was a male predominance of CHD among school going children from Alexandria, Egypt.^{10,11} The observed high prevalence of operable CHD among school going girls may indicate a negligence of rearing up of our female babies than that of their male counterparts. Actually in most of our families boys get more care or importance than that of girls in terms of their feeding, academic education, health check up irrespective of the social status of family in the society.

Again among 140 male students with CHD 108 were from low income group. Similar trend was seen for female students 143 of the girls with CHD were from low income group, Table-II. out of 10,105 school going children of low income families screened for CHD, a total of 250 and, on the other hand 40 prevalence in children of middle income families had CHD. The high prevalence of CHD among school going children of low income group irrespective of sex indicates either ignorance or lack of health consciousness among these group of population. Thus the observed high prevalence rate of CHD among school going children in the present study may be due to inclusion of poor and under privileged boys and girls who are living in the rural area.

Therefore the findings of the present survey suggest the need of large scale screening of apparently healthy children for CHD irrespective of family status, and family members of those suffering from CHD and that special attention to be paid to the occurrence of rheumatic fever or rheumatic heart disease in case of CHD.

Conclusion:

Inter Atrial septal defect and inter ventricular septal defects are common congenital heart diseases which are completely correctable, needs more and large scale screening for detection of diseases in community level to give direct benefit to the neglected rural people of Bangladesh.

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