to the mother regarding the adequacy of her milk. Though Indian studies do not mention timing of the so called 'transient lactational crisis', workers from developed countries have resorted that most of these events occur during the first 3 months of lactation(5,6).

Lactational failure was related to nipples in 11.1% cases. It is, therefore, important to do an antenatal and postnatal examination of the nipples in mothers in order to diagnose retracted nipples and take appropriate measures(7). A significant proportion (30.4%) of mothers had resorted to top feeding on their own accord. Hence, promotion of breastfeeding should be introduced into high school education. Other workers have reported on hospital staff promoting top feeds(8). Our results also point out that not only obstetricians and family physicians but even pediatricians need motivation towards promotion of breastfeeding.

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Prevalence of Congenital Heart Disease in School Children

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Until 1930, it was believed that rheumatic heart disease was by far the most common form of cardiac disease in children(1). Within recent years it has become obvious that, in most cardiac centres, congenital heart disease (CHD) is the more common of the two. Most cases of congenital heart disease die in early infancy and some conditions do not manifest in the first few years of life, emphasizing the need to

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establish the prevalence of this condition. We report our findings in the study conducted amongst school children.

Material and Methods

Eight thousand four hundred and forty nine school going children of Agra city, between the ages of 5 to 15 years, were screened for CHD. Random selection of schools was done in such a way that the sample drawn represented the children from various ages, sex, socio-economic and religious groups. An effort was made to include all the children from selected institutions. All of these children were subjected to a thorough clinical examination with particular emphasis on cardiovascular system. Children suspected of having any cardiac lesion were called to the Department of Pediatrics and re-examined by the cardiologist in order to confirm the diagnosis of cardiac involvement. The final diagnosis was made on the basis of clinical, roentgenographic, electrocardiographic and M-mode echocardiographic findings.

Results

Of 8449 children, 44 (0.5% or 5.2 per 1000) were suffering from congenital heart disease (CHD, *Table I*). Twenty of the 3469 females (0.6%) were having CHD as compared to 0.5% males. However, the difference between the two groups was not statistically significant. The prevalence rate was 0.6% in families having less than 5 members, 0.5% in those having 5 to 10 members and 0.6% in those having more than 10 members. Thirty one cases (70.4%) were diagnosed for the first time, to be having a congenital heart disease, during the survey.

Failure to gain weight (34%) and repeated infections (29.6%) were the two main symptoms while a large number of patients (40.9%) wee asymptomatic. Acyanotic CHD was present in 84.1% cases whereas cyanotic CHD was seen in 15.9% cases only. *Table II* presents the frequency of individual cardiac lesion according to sex distribution.

Discussion

Prevalence rate for congenital heart disease (CHD) in India is not known due to insignificant population surveys. Most of incidence of CHD are obtained from hospital based data.

The observed prevalence of 5.2 per 1000 or 0.5% in this study is comparable to the reported incidence of 6 to 8 per 1000 CHD at birth from the developed countries(2-4). The reason for slightly lower figure for prevalence is quite obvious as incidence rate is usually measured at birth, when a number of other CHDs, some of them incompatible with life, are more frequent than at a later age.

TABLE I–*Distribution of Cases of Congenital Heart Disease (CHD)*

Age group (yr)	Prevalence of CHD			Total	Age specific prevalence (%)
	Number	Male	Female		
5 - 8	3067	9	9	18	0.6
8 - 11	3096	6	9	15	0.5
11 - 15	2286	9	2	11	0.5

TABLE II—*Frequency and Sex Distribution of Congenital Heart Disease*

Cardiac lesion	Male (n=24)	Female (n=20)	Total No. (n=44)	Total %
Ventricular septal defect	7	11	18	40.9
Tetralogy of Fallot	3	3	6	13.6
Atrial septal defect	3	2	5	11.4
Pulmonary stenosis	3	1	4	9.1
Aortic stenosis	4	-	4	9.1
Mitral valve prolapse syndrome (MVPS)	2	1	3	6.8
Patent ductus arteriosus (PDA)	1	1	2	4.5
Transposition of great vessels with Ebstein anomaly	-	1	1	2.3
Ventricular septal defect with aortic regurgitation	1	-	1	2.3

Bidwai *et al.*(5) and Jain, *et al.*(6) found a predominance of males over females, whereas in this study, slight female preponderance was noticed. As the above two previous studies were based entirely on hospital admission data, it is possible that the proportion of females admitted to various hospitals is usually far less than the actual amount of disease prevalent among them.

The preponderance of acyanotic heart lesions (84.1%) among all congenital heart diseases, is in conformity with the results of other Indian and Western studies(2,3,5,9).

Studies from both India and developed countries have reported ventricular septal defect (VSD) as the commonest congenital heart disease(2,3,5,9). Keith *et al.*(3) reported ventricular septal defect in 28.3% while Srivastava and Tandon(9) diagnosed it in 27.1% cases. The observed incidence of ventricular septal defect (40.9%) in our study is slightly higher. One explanation may be that most of the above studies were based on hospital admission data and dealt with comparatively younger age group (0-15 years) patients when other complex congenital heart diseases are more prevalent.

Tetralogy of Fallot was the second commonest congenital heart disease after ventricular septal defect in our study, being detected in 13.6% cases. This is an agreement with the results from other Indian studies(5,6,9,10). However, studies from developed countries reported an incidence of 6%(2) to 9.7%(3). The incidence of Tetralogy of Fallot is higher in our country than what is found in western world.

One significant finding of the present study was comparatively high incidence (9.1%) of pulmonary stenosis (PS) which is contrary to what is described(5,9) by many other Indian workers (2.8-2.9%). However,

this figure is comparable to the findings of Nadas *et al.*(2) 7.5%, Keith, *et al.*(3) 9.9% and other Western workers(7). The relative rarity of coarctation of aorta among Indian population is also confirmed by other workers(5,8,9).

The observed female preponderance of ventricular septal defect is not compatible with the results of Bidwai *et al.*(5) and Rao and Reddi(8), who found a male predominance for the same. However, increased frequency of aortic stenosis and atrial septal defect among male patients is also supported by Jain *et al.*(6) and Rao and Reddi(8).

Our study suggests that a majority of congenital heart diseases in children may remain undetected unless specific efforts are made to diagnose them and that the prevalence of ventricular septal defect is the highest amongst school children.

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Prenatal Diagnosis of Sickle Cell Anemia Using Polymerase Chain Reaction

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Sickle cell mutation is one of the first reported single gene abnormality in the world, causing diseased condition in the homozygous state. Sickle cell hemoglobin is caused due to mutation in 6th codon of beta globin gene (a change from CTC to CAC in coding sequence of DNA).

WHO has reported an estimated 60×10^6 carriers in the world for hemoglobin S and 1,20,000 homozygotes are added every year in the world(1). In India, there are about