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# CONGENITAL HEART DISEASE IN INFANTS IN GULBARGA REGION OF KARNATAKA

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## ABSTRACT

*Congenital heart diseases are primarily disease of neonates, infants and children. The burden of CHD in India is likely to be enormous due to very high birth rate. The reported incidence is 8-10/ 1000 live births. To know the pattern of clinical presentation of various congenital heart diseases in 0-1 year age group. 50 cases of CHD proven by 2D echocardiography were studied for 2 years period. Present study included all infants in birth – one year age group and excluded all preterm babies and patient with persistent pulmonary hypertension. Out of the 50 cases of congenital heart disease. Growth retardation and CCF were the commonest complication. The mortality rate was 18% with VSD as the leading cause of death among the CHD. The commonest cause of death among these patients was refractory CCF. A cardiac evaluation with echocardiography is also necessary in all cases of LRTI and FTT. Early diagnosis, close monitoring and timely intervention in cases of CHD will go a long way in reducing the morbidity and mortality to a large extent.*

## KEY WORDS

*Congenital heart disease; 2D echocardiography*

## INTRODUCTION

Congenital Heart Diseases (CHD) are primarily seen in neonates, infants and children, although in our country it is not uncommon to see adults with uncorrected CHD. The burden of congenital heart disease in India is likely to be enormous due to a very high birth rate. This heavy burden emphasizes the importance of this group of heart diseases. The reported incidence of CHD are 8-10/1000 live births according to various studies from different parts of the world.[1] It is believed that this incidence has remained constant worldwide.[2]

Nearly one-third of these CHD are critical requiring intervention in the first year of life itself.[3] Rapid advances have taken place in the diagnosis and treatment of CHD over the last six decades. There are diagnostic tools available today by which an accurate diagnosis of CHD can be made even before birth. With currently available treatment modalities, over 75% of infants born with congenital heart disease can survive beyond the first year of life and many can lead normal lives thereafter. However, this privilege of early diagnosis and timely management is restricted to children in developed countries only. Unfortunately majority of children born in developing countries with CHD do not get the necessary care, leading to high morbidity and mortality.

There is no community based data for the incidence of congenital heart disease at birth in

India. Since a large number of births in our country take place at home, mostly unsupervised by a qualified doctor, hospital statistics are unlikely be truly representative. The congenital heart disease has been the subject of innumerable studies both regarding prevalence and clinical features in western countries. The few studies carried out in India were either community or school based and they did not indicate the clinical profile of CHD. It was therefore decided to carry out hospital based study of clinical profile of congenital heart disease in infancy at Basaveshwar Teaching & General Hospital and Sangameshwar Teaching Hospital attached to M.R.Medical College, Gulbarga.

## OBJECTIVES

To know the pattern of clinical presentation of various congenital heart disease in 0-1 year age group.

## METHODOLOGY

**Methods of collection of data:**

Infants presenting with features suggestive of congenital heart disease and proven by 2D echocardiography were studied over a period of 2 years from October 2005 to September 2007 admitted in Sangameshwar Hospital, Gulbarga and Basaveshwar Teaching & General Hospital, Gulbarga.

**Inclusion Criteria:**

All patients presenting with clinical features like breathlessness, recurrent LRTI, failure to thrive, cyanotic spells, congestive cardiac failure, murmur in the age group of term neonates to first birthday.

**Exclusion Criteria:**

- Preterm neonates.
- More than one year.
- Patients with persistent pulmonary hypertension.

## RESULTS

In this clinical study, compromising of age 0-1 years, 50 cases of proven CHD were studied in the Department of Paediatrics of M.R.Medical College, Gulbarga at Basaveshwar Teaching & General Hospital and Sangameshwar Hospital, Gulbarga from October 2005 to September 2007. Following observations were made in the present study.

**Table-1: Age specific incidence of CHD**

| Age | No. of cases | Percent |
|---|---|---|
| Birth – 1 week | 15 | 30.00 |
| 1 week – 1 month | 6 | 12.00 |
| 1 month – 1 year | 29 | 58.00 |
| **Total** | **50** | **100.00** |

Majority of patients in this study i.e., 58% presented in the 1 month to 1 years period, whereas 42% presented in the neonatal life, of which 30% were in the early neonatal period and 12% in late neonatal period.

**Table-2: Sex of Children**

| Sex | No. of cases | Percent |
|---|---|---|
| Male | 26 | 52.00 |
| Female | 24 | 48.00 |
| **Total** | **50** | **100.00** |

52% of the children were male, while 48% were female with a ratio of 1.08:1.

**Table-3: Residence**

| Residence | No. of cases | Percent |
|---|---|---|
| Urban | 37 | 74.00 |
| Rural | 13 | 26.00 |
| **Total** | **50** | **100.00** |

Majority of the patients i.e., 74% of cases were from urban area and 26% were from rural area.

**Table-4: Consanguinity**

| Consanguinity | No. of cases | Percent |
|---|---|---|
| First degree | -- | -- |
| Second degree | 7 | 14.00 |
| Third degree | 5 | 10.00 |
| Non-consanguinity | 38 | 76.00 |
| **Total** | **50** | **100.00** |

In the present study, 76% of the cases reported a non-consanguineous marriage and 24% has history of some degree of consanguinity with 14% showing a second degree and 10% having third degree consanguinity marriage.

**Table-5: Birth order**

| Birth order | No. of cases | Percent |
|---|---|---|
| First | 10 | 20.00 |
| Second | 16 | 32.00 |
| More than two | 24 | 48.00 |
| **Total** | **50** | **100.00** |

In 48% of the cases, birth order was more than 2 and in 32% birth order 2 and only 20% had birth order of one.

**Table-6: Immunization Status of Patient**

| Immunization Status | No. of cases | Percent |
|---|---|---|
| Completely immunized | 20 | 40.00 |
| Partial | 9 | 18.00 |
| Unimmunized | 21 | 42.00 |
| **Total** | **50** | **100.00** |

In this study 42% of patients were unimmunized and 58% had some immunization with 40% complete and 18% had partial immunization.

**Table-7: Birth History**

| Birth history | No. of cases | Percent |
|---|---|---|
| Uneventful | 40 | 80.00 |
| Birth asphyxia | 5 | 10.00 |
| MAS | 5 | 10.00 |
| **Total** | **50** | **100.00** |

Majority of children had an uneventful delivery, while 20% had significant birth history in the form of birth asphyxia and meconium aspiration syndrome.

**Table-8: Age and Sex Incidence of Specific CHD**

| Defects | Birth – 1 week | | | One week – one month | | | 1 month – 1 year | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | Male | Female | Total | Male | Female | Total | Male | Female | Total | |
| **Acyanotic** | | | | | | | | | | **34** |
| VSD | 1 | 1 | 2 | -- | 1 | 1 | 5 | 7 | 12 | 15 |
| ASD | 1 | 1 | 2 | 1 | -- | 1 | 3 | 2 | 5 | 8 |
| PDA | -- | 1 | 1 | 1 | -- | 1 | 2 | 1 | 3 | 5 |
| AVSD | -- | -- | -- | -- | 1 | 1 | -- | 1 | 1 | 2 |
| Dextro cardia | 1 | 1 | 2 | -- | -- | -- | -- | -- | -- | 2 |
| HOCM | -- | -- | -- | -- | 1 | 1 | -- | -- | -- | 1 |
| COA | -- | -- | -- | -- | -- | -- | 1 | -- | 1 | 1 |
| **Cyanotic** | | | | | | | | | | **16** |
| TOF | -- | 1 | 1 | -- | -- | -- | 3 | 2 | 5 | 6 |
| TGV | 2 | -- | 2 | -- | 1 | 1 | -- | -- | -- | 3 |
| TAPVC | 1 | 1 | 2 | -- | -- | -- | -- | -- | -- | 2 |
| Ebstein | 1 | - | 1 | -- | -- | -- | 1 | -- | 1 | 2 |
| DORV | -- | -- | -- | -- | -- | -- | -- | 1 | 1 | 1 |
| Dextrocardia with pulmonary atresia with PDA | 1 | -- | 1 | -- | -- | -- | -- | -- | -- | 1 |
| Dextrocardia with tricuspid atresia with ASD | -- | 1 | 1 | -- | -- | -- | -- | -- | -- | 1 |
| Total | | | 15 | | | 6 | | | 29 | 50 |

In present study VSD (30%) was the commonest CHD followed by ASD (16%) in the acyanotic group and among cyanotic CHD, TOF (12%) was the commonest followed by TGV (6%).

## DISCUSSION

Congenital heart disease (CHD) occurs in 0.5 – 0.8% of live born children with a higher percentage in those aborted spontaneously or still born. CHD has become an important cause of morbidity and mortality in infancy and accounts for two third of all major birth defect along with neural tube defect. 2 – Dimensional echocardiography with colour Doppler has revolutionized the diagnosis and management of cardiac malformation. It is a non invasive investigation that can precisely diagnose most congenital heart disease as well as offer treatment options, whether medical or surgical.

In view of this we undertook the present study to evaluate the clinical profile of CHD in infancy

at Basaveshwar teaching and general hospital and Sangmeshwar hospital of M R Medical College Gulbarga over a period of two years from October 2005 to September 2007.

**Profile of CHD and Comparison of our findings with other studies**

| Type of defect | **Present study (n=50)** | Tank S et al (2004) (n=147) | Kasturi et al (1999) (n=108) | Vashistha et al (1993) (n=44) | Rao VS et al (1974) (n=400) | Jain KK et al (1971) (n=55) | Bidwai et al (1971) (n=378) |
|---|---|---|---|---|---|---|---|
| Acyanotic | | | | | | | |
| VSD | **15 (30.00)** | 54 (36.73) | 29 (27.00) | 18 (40.90) | 45 (40.90) | 25 (45.40) | 91 (24.00) |
| ASD | **8 (16.00)** | 18 (12.25) | 26 (24.00) | 5 (11.40) | 26 (23.60) | 2 (3.60) | 20 (21.96) |
| PDA | **5 (10.00)** | 7 (4.76) | 7 (6.00) | 2 (2.40) | 39 (35.40) | 3 (5.40) | 39 (10.30) |
| AVSD | **2 (4.00)** | 3 (2.04) | -- | -- | -- | -- | -- |
| Dextro cardia | **2 (4.00)** | 1 (0.68) | -- | -- | -- | -- | -- |
| HOCM | **1 (2.00)** | 1 (0.68) | -- | -- | -- | -- | -- |
| COA | **1 (2.00)** | 1 (0.68) | -- | -- | -- | 1 (1.80) | -- |
| **Cyanotic** | | | | | | | |
| TOF | **6 (12.00)** | 26 (17.68) | 10 (9.00) | 6 (13.60) | 53 (28.60) | 10 (18.60) | -- |
| TGV | **3 (6.00)** | 8 (5.42) | 3 (3.00) | 1 (2.30) | 25 (13.5) | 1 (1.80) | -- |
| TAPVC | **2 (4.00)** | 4 (2.72) | 1 (1.00) | -- | 4 (2.16) | -- | -- |
| Ebstein | **2 (4.00)** | 5 (3.40) | 1 (1.00) | -- | 4 (2.16) | -- | -- |
| DORV | **1 (2.00)** | 2 (1.36) | -- | -- | -- | -- | -- |
| Dextrocardia with pulmonary atresia with PDA | **1 (2.00)** | -- | -- | -- | -- | -- | -- |
| Dextrocardia with tricuspid atresia with ASD | **1 (2.00)** | -- | -- | -- | -- | -- | -- |

Present study had 34 cases of acyanotic CHD (68%) and 16 cases of cyanotic CHD (32%). The preponderance of acyanotic CHD is in concordance with the results of other Indian[3] and western studies.[4,5] Similar incidence was reported by Tank S et al[9] 2004 (5.4%). In our study there were two cases each of Ebsteins anomaly (4%), TAPVC (4%), AVCD (4%), Dextrocardia (4%). We found one case each of cardiomyopathy (2%), CoA (2%), DORV (2%) and tricuspid atresia (2%). This observation is slightly higher than other Indian studies[5] as shown in the above table.

**Sex Distribution:**

Following studies show male preponderance, Samanek M et al[6] 1990 (1.09:1), Rao VS et al[7]

1974(1.25:1), Kinare SG et al[8] 1981(1.23:1), Tank S et al[7] 2004 (1.88:1) In the present study, 26 patients (52%) are male and 24 patients (48%) were female with a male to female ratio of 1.08:1. It shows slight male preponderance for CHD. Present study is in corcordance with Samnek M et al[6] (1990). There are gender differences in the occurrence of specific heart lesions.

**Age Specific Incidence**

When considering the age of presentation, maximum cases were in infancy (58%). There were only 42 % cases in neonatal period, as was also seen with other Indian studies. In west, however there is higher number of patients in neonatal period which could be due to the fact that fetal echocardiography forms part of their routine antenatal examination.

**Locality**

In the present study nearly 3/4$^{th}$ cases were from urban areas (74%) and 1/4$^{th}$ were from rural area (26%). This distribution may not be a reflection of true incidence and this discrepancy can be attributed to the availability of specialized care, specialist doctors and advanced facilities in urban areas.

**Etiological Factors**

According to Nora[10] study, the most vulnerable time for damage due to exposure to teratogenic agents is between 18-60 days. In the present study, no significant antenatal history of any drug intake or infection or exposure to radiation could be elicited.

**Sibling Affected**

Nadas and Fyler[11] have mentioned that 2% of sibling may suffer from similar complaints and Nora has observed that 0.3% of sibling can have similar cardiac malformation. The present study reported occurrence of 2 cases which had complaints among siblings with congenital diseases. One had tracheo-oesophageal fistula and 1 patient with TOF had a sib who died at early age because of a cyanotic CHD which could not be diagnosed. The findings in the present study correlates with observation of Nadas and Fyler.[11]

**Consanguinity**

A study by Susan MB et al[12] 1979 reported that first degree consanguinity was significantly associated with CHD. Shafi T et al[13] 2003 reported that there was a significant association between children born of consanguineous marriage and risk of CHD. In this present study, it was found that 12 patients (24%) were products of consanguineous marriage, 7 patients (14%) were 2$^{nd}$ degree and 5 patients (10%) were products of 3$^{rd}$ degree consanguineous marriage. Rest 38 patients (76%) had no history of consanguinity. Hence it is clear that consanguinity is a risk factor for development of CHD.

**Birth Order**

Tay JS et al[14] (1982), studied association of birth order and CHD in 100 chinese children and 100 controls and he reported that higher incidence of CHD was present in children with higher birth order. Zhan SY et al[15] (1991) reported that higher incidence of CHD was present in higher order babies. Incidence of CHD in 1$^{st}$ born babies was 20%, 2$^{nd}$ born was 32% and more than 2 was 48% in our study. The present study is in concordance with the above studies.

**Immunisation**

Tank S et al[9] (2004) reported 15.46% of unimmunised cases, 55% cases completely immunized while 29.25% were partially immunized. Immunization was given according to UIP schedule in the study group. In the present study 20 patients (40%) were completely immunized till age, while 9 patients (18%) were partially immunized, 21 patients (42%) were unimmunized however these patients were all neonates. Present study reported slightly lower incidence when compared to this study. The

common reason stated for non immunization or partial immunization were recurrent LRTI's, FTT, ignorance and illiteracy about immunization.

**Anthropometric Status**

In this study, anthropometric status was assessed by ICMR charts. Length and weight were markedly affected in cases of CHD, with 82% patients of less than 50$^{th}$ percentile, out of which 52% patients were less than 10$^{th}$ percentile, and 30% were between 10 to 50$^{th}$ percentile. 9 patients (18%) had normal anthropometric status. Present study reported the similar observation as reported by other Indian[3] and western studies.[4,5]

## CONCLUSION

Out of the 50 proven cases of congenital heart disease studied from October 2005 to September 2007, the highest incidence was noted in 1 month to 1 year age group. Out of the 50 cases of congenital heart disease.

Breathlessness, LRTI, FTT, fever, tachypnea, tachycardia, cyanosis were the common clinical presentation of majority of cases. Male preponderance was noted in both cyanotic and acyanotic CHD. These children were deprived of basic medical care in the form of immunization. In our study 40% reported complete immunization while 18% were partial immunized and 42% were unimmunised.

Malnutrition was seen in 82% having less than 50$^{th}$ percentile anthropometric data.Musculoskeletal anomalies were commonest extra cardiac anomaly with Down syndrome the next most common.

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