pISSN 2349-3283 | eISSN 2349-3291

Original Research Article

DOI: http://dx.doi.org/10.18203/2349-3291.ijcp20182554

Spectrum of congenital heart disease in neonates in a tertiary care centre of Northern India

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Received: 13 April 2018 Accepted: 05 May 2018

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ABSTRACT

Background: Congenital heart defects (CHDs) are an important cause of mortality and morbidity in children representing a major global health burden. Not much of Indian data is available particularly from this part of the country. So, authors conduct a retrospective study to know the spectrum of congenital heart disease in our set up. Methods: A retrospective hospital based study was carried out in the neonatal intensive care unit of SMGS Hospital,

Jammu from January 2017 until December 2017 to see the spectrum of CHD.

Results: There were 5552 neonates admitted during the study period out of which 68 were found to have CHD. The prevalence was 12.24 per 1000 admitted neonates. Out of 68 admitted neonates, 41were males (60.3 %) and 27 females (39.7%). Clinically Respiratory distress (51.47%) was the commonest presenting symptom followed by Cyanosis (16.18%), refusal of feed (13.23%) and murmer (10.3%).46 (67.65%) newborn had acyanotic and 22 (32.35%) cyanotic congenital heart lesions. Ventricular septal defect (27.94%) was the commonest acyanotic congenital heart defects whereas Tetrology of Fallot (14.70%) was the commonest cyanotic congenital heart diseases. Cleft lip and Cleft Palate was found in 12.5% followed by Down's syndrome in 3.57% of cases of newborns with CHD. The mode of delivery was spontaneous in 64.71% followed by Elective LSCS were 23.53% and Emergency LSCS were 11.76%.

Conclusions: There is an urgent need for government and non-government organizations to establish well-equipped cardiothoracic surgical centers across the country especially in Jammu to cater for children with CHDs.

Keywords: Congenital heart disease, Echocardiography, Neonates, Prevalence

INTRODUCTION

Congenital heart disease (CHD) is the most common cause of major congenital anomalies accounting 28.0%, representing a leading global health problem with prevalence in neonate of be 5-8/1000.1-4 Congenital heart disease, in a definition proposed by Mitchell et al, is "a gross structural abnormality of the heart or intra-thoracic great vessels that is actually or potentially of functional significance". The incidence of Congenital heart disease in India is increasing, probably due to increase of birth

rate, earlier and more accurate diagnostic modalities, more awareness amongst parents due to social media. The reported incidence of congenital heart disease (CHD) is 8-10/1000 live births.^{5,6} The reported prevalence of congenital heart diseases (CHD) ranges from 1.01 to 17.5 per 1000 live births according to various studies over the world.⁷⁻⁹ In community based studies from India the prevalence of CHD ranges from 0.8-5.2/1000 patients.8 Nearly 1/3rd of the congenital heart diseases (CHD) are critical requiring interventions in the first year of life.¹⁰ 7% of the neonatal deaths are due to congenital

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malformations, 25% of which are cardiovascular.¹¹ In India, 10% of the present infant mortality may be accounted for by congenital heart disease as reported by Saxena et al.¹² The frequency of different major forms of CHD also differs greatly in various study. The clinical presentation of CHD varies according to the type and severity of the defect. So, authors conducted a retrospective study to know the spectrum of congenital heart disease in our set up.

METHODS

This retrospective study was carried out over a period of one year from January 2017 until December 2017 among the admitted neonate in the Neonatal Intensive Care Unit (NICU) of SMGS Hospital, Jammu age ranging from newborn to 28 days. A thorough clinical examination was carried out within first 24 hours of admission. Congenital Heart Disease (CHD) was suspected in the presence of following criteria defined by Mitchell et. Al - presence of cardiac murmur, presence of cyanosis or refusal of feeds, cyanosis associated with feeding, presence of congestive heart failure or failure to thrive.¹

Detailed history was collected from parents or caretaker regarding family history of congenital heart disease. The questionnaire also enquired about; significant history of ingestion of drugs, hormone, exposure to radiation, history of fever with rash prior six months of conception and in 1st trimester, maternal age and parity of the mother.

The birth weight, age, sex and gestational age of babies were also recorded. All suspected patients were investigated by doing a chest X-ray/Echocardiography. Additional screening was done for babies of diabetic mothers, babies with Down's syndrome and babies with congenital malformations.

RESULTS

This study was done retrospectively in NICU, SMGS hospital, Department of Pediatrics and Neonatology GMC Jammu from January 2017 to December 2017 (1 years span). There were 5552 neonates (birth to 28 days) admitted during the study period out of which 68 were found to have CHD. The prevalence was 12.24 per 1000 admitted neonates. Out of these, 46 (67.65%) patients had acyanotic and 22 (32.35%) cyanotic congenital heart lesions.

Table 1: Gender distribution of newborns with CHD.

Sex	No. of cases	Percentage
Male	41	60.3
Female	27	39.7

A total of 68 patients were included; 41 males (60.3%) and 27 females (39.7%) with male:female ratio of 1.52:1.

Table 2: Clinical findings of the CHD cases.

Presentation	No. of cases (n=68)	Percentage
Respiratory distress	35	51.47
Cyanosis	11	16.18
Refusal of feed	9	13.23
Murmer	7	10.3
Others	6	8.82

Out of 68 neonates, 35 (51.47%) were having respiratory distress, 11 (16.18%) were having cyanosis, 9 (13.23%) feeding difficulty and 7 (8.82%) presented with murmer. Other nonspecific and non-significant symptoms like fever, cough, tachypnoea etc were also noted.

Table 3: Sex and percentage distribution of Acyanotic heart disease (ACHD).

Acyanotic heart disease	Male	Female	Total	%
Ventricular septal defect (VSD)	11	8	19	27.94
Patent ductus arteriosus (PDA)	4	9	13	19.11
Atrial septal defect (ASD)	6	3	9	13.23
Atrioveantricular septal defect (AVSD)	1	2	3	4.41
Pulmonary stenosis (PS)	1	1	2	2.96
Total	23	23	46	67.65

Out of 68 neonates 46 were having ACHD. Among these 46 neonates who presented with ACHD, 19 (27.94%) were having VSD,13 (19.11%) were having PDA,9 (13.23%) having ASD, 3 (4.41%) having AVSD and 2 (2.96%) neonates having PS. The male:female ratio among neonates of ACHD is 1:1.

Table 4: Sex and percentage distribution of Cyanotic heart disease (CHD).

Cyanotic heart disease	Male	Female	Total	%
Tetrology of Fallot (TOF)	7	3	10	14.70
Transposition of the great arteries (TGA)	3	2	5	7.35
Complex congenital heart disease (CCHD)	3	1	4	5.88
Tricuspid atresia (TA)	-	2	2	2.94
Total anamolous pulmonary venous return (TAPVR)	-	1	1	1.48
Total	13	9	22	32.35

Out of 68 neonates 22 were having CHD. Among these 22 neonates who presented with CHD 7 (14.70%) were having VSD, 5 (7.35%) were having TGA ,4 (5.88%) having CCHD, 2 (2.94%) having TA and 1 (1.48%) neonate was having PS. The male:female ratio among neonates of CHD is 1.44:1.

Table 5: Associated non cardiac anomalies.

Non cardiac anomalies	Male	Female	Total	%
Cleft lip cleft palate	3	4	7	12.5
Down's syndrome	2	-	2	3.57
Meningomyelocele (MMC)	-	1	1	1.78
Cataract	1	-	1	1.78
Renal anomaly	1	-	1	1.78
Total	7	5	12	21.41

Significantly associated non-cardiac anomalies were also seen like Cleft lip and Cleft Palate in 7 (12.5%), Down's Syndrome in 2 (3.57%), MMC in 1 (1.78%), Cataract in 1 (1.78%) and renal anomaly was found in 1 (1.78%) newborn.

Table 6: Maternal history and mode of delivery.

Maternal history	Total number of mothers	Percentage
Anti-emetics	8	14.54
Anti-epileptics	2	3.63
Maternal infection	2	3.63
Antipyretic	1	1.81
Mode of delivery		
Spontaneous	44	64.71
Elective LSCS	16	23.53
Emergency LSCS	8	11.76

Table 6 shows pattern of risk factors in cases of babies with congenital heart disease. Drug intake like antiemetics, anti-epilepticus, anti-pyretics were found in 8 (14.54%), 2 (3.63%) and 1 (1.81%) cases respectively Maternal infection was noticed in 2 (3.63%) cases. The commonest mode of delivery was spontaneous 44 (64.71%), Elective LSCS were done in 16 (23.53%) and Emergency LSCS were done 8 (11.76%).

DISCUSSION

The primary objective of our study was to observe the pattern of congenital heart disease in the neonatal intensive care unit of SMGS Hospital, Jammu. Present analysis gives a prevalence of 12.24 /1000 patients. Study conducted by Sawant SP from Mumbai showed a prevalence of 13.28 per 1,000 live births quite near to our study. Studies conducted by Bhat NK from Uttarakhand, India and Kapoor R from Kanpur India showed a prevalence of 8.54% per 1,000 and 26.4% per 1000 patients respectively. Respiratory

distress (51.47%) was the commonest presenting system followed by Cyanosis (16.18%), refusal of feed (13.23%) and murmer (10.3%). Similar observation were also detected by others. 10,15,16 The commonest type of acyanotic heart disease is ventricular septal defect (27.94%) whereas Tetralogy of Fallot is the commonest type of cyanotic congenital heart disease (14.70%) as reported by several studies.^{3,12,17-20} Present study showed significant association of non-cardiac anomalies in 12 (21.41%) cases, among which cleft lip cleft palate (12.5%) and Down's syndrome (3.57%) were the commonest. Studies done by Sah GS, Rahaman S et al and Hoffman also showed similar results. 15,21,22 Maternal diseases like diabetes mellitus, maternal infection, hypertension and drugs could affect the increase occurrence of CHD in neonates. Our study found that only 3.63% mothers had history of infections during pregnancy. Among drugs anti-emetic were taken by 14.54% mothers, anti-epileptic by 3.63% and anti-pyretic by 1.81% mothers as showed by other studies also. 16,23 Neonates with CHD are more prone to develop intrauterine fetal distress that could mean frequent LSCS either elective or emergency during delivery, but our study showed the frequency of normal delivery higher than the LSCS.

CONCLUSION

Congenital heart disease is common in pediatrics. Ventricular septal defect and Fallot's tetrology are the leading ones in acyanotic and cyanotic groups but other kind of congenital heart diseases were also seen. In this era, we have the most accurate diagnostic modalities, any clinical suspicion of congenital heart disease should be confirmed by echocardiography. More doctors should be trained in diagnosing congenital heart disease by echocardiograph, so that children can be treated earlier there by reducing morbidity and mortality.

Funding: No funding sources Conflict of interest: None declared

Ethical approval: The study was approved by the

Institutional Ethics Committee

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Cite this article as: Qazi M, Saqib N. Spectrum of congenital heart disease in neonates in a tertiary care centre of Northern India. Int J Contemp Pediatr 2018;5:1505-8.