Original Research Article

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

Mahvish Qazi¹, Najmus Saqib²*

¹Department of Gynecology and Obstetrics, ASCOMS, Sidhra, Jammu, Jammu and Kashmir, India
²Department of Pediatrics, GMC Jammu, Jammu and Kashmir, India

Received: 13 April 2018
Accepted: 05 May 2018

*Correspondence:
Dr. Najmus Saqib,
E-mail: shstar321@gmail.com

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, 41 were 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 Tetralogy 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 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”.¹ 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 In community based studies from India the prevalence of CHD ranges from 0.8-5.2/1000 patients.⁸ Nearly 1/3⁴ of the congenital heart diseases (CHD) are critical requiring interventions in the first year of life.⁹ 7% of the neonatal deaths are due to congenital...
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.13

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% |
| Atrioventricular 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 | %   |
|-------------------------------|------|--------|-------|-----|
| Tetralogy 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 1.4:1.

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    | -      | 2     | 2.73  |
| 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 anti-emetics, anti-epileptics, 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.12 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.5,14 Clinically 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 intraterine 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

REFERENCES

1. Mitchell SC, Korones SB, Berendes HW. Congenital heart disease in 56, 109 births. Incidence and natural history. Circulation. 1971;43:323-32.
2. Dolk H, Loane M, Garne E. For the European Surveillance of Congenital Anomalies (EUROCAT) working Group. Congenital heart defects in Europe: prevalence and perinatal mortality, 2000-2005. Circulation. 2011;123:841-9.
3. Samanez M, Voriskova M. Congenital heart disease among 815,569 children born between 1980 and 1990 and their 15 year survival: a prospective Bohemia survival study. Pediatr Cardiol. 1999;20:411-17.
4. Wren C, Richmond S, Donaldson L. Presentation of congenital heart disease in infancy: implications for routine examination. Arch Dis Child Fetal Neonatal Ed. 1999;80:49-53.
5. Behrman RE, Kliegman RM, Jenson HB. Congenital heart disease. In: Nelson textbook of Pediatrics, 16th edn. Eds., Harcourt Asia Pvt. Ltd;2000:1362-63.
6. Fyler DC, Buckley LP, Hellenbrand WE, Cohn HE. Report of the New England regional infant caring Program. Pediatrics. 1980;65:375-461.
7. Brassili A, Mokhtar SA, Dabous NI, Zaher SR, Mokhtar MM, Zaki A. Congenital heart disease among school children in Alexandria, Egypt: an overview on prevalence and relative frequencies. J Trop Pediatr. 2000;46:357-62.
8. Kapoor R, Gupta S. Prevalence of Congenital Heart Disease, Kanpur, India. Indian Pediatr. 2008;45:309-11.
9. Vashishtha VM, Kalra A, Kalra K, Jain VK. Prevalence of congenital heart disease. Indian Pediatr. 1999;30:1337-40.
10. Khalil A, Aggarwal R, Thirupuram S, Arora R. Incidence of congenital heart disease among hospital live births in India. Indian Pediatr. 1994;31:519-26.
11. Kinare SG, Sharma S. Congenital Heart Disease in 1st year of life (an autopsy study of 270 cases). Ind J Paed. 1981;48:745-54.
12. Saxena A. Congenital heart disease in india: a status report. Ind J Paed. 2005;72:595-8.
13. Sawant SP, Amin AS, Bhat M. Prevalence, pattern and outcome of congenital heart disease in Bhabha Atomic Research Centre Hospital, Mumbai. Indian J Pediatr. 2013;80:286-91.
14. Bhat NK, Dhar M, Kumar R, Patel A, Rawat A, Kalra BP. Prevalence and pattern of congenital heart disease in Uttarakhand, India. Indian J Pediatr. 2013;80:281-5.
15. Shah GS, Singh MK, Pandey TR, Kalakheti BK, Bhandari GP. Incidence of congenital heart disease in tertiary care hospital. Kathmandu Univ Med J. 2008;6(1):33-6.
16. Islam MN, Hussain MA, Khaleque MA, Das MK, Khan MRH, Bari MS et al. Prevalence of congenital Heart Disease in Neonatal in a Tertiary Level Hospital. NJMS. 2013;2(2):91-5.
17. Abqari S, Gupta A, Shahab T, Rabban MU, Ali SM, Firdaus U. Profile and risk factors for congenital heart defects, a study in a tertiary care hospital. Annals Pediatric Cardiol. 2016;9(3):216-21.
18. Ashraf M, Chowdhary J, Khajuria K, Reyaz AM. Spectrum of congenital heart diseases in Kashmir, India. Indian Pediatr. 2009;46:1107-8.
19. Jennifer HK, Anne MA, Jack R. Effect of prenatal diagnosis on outcome in patients with congenital heart disease. Neoreviews. 2005;6:326-31.
20. Moller JH, Moodie DS, Blees M, Norton JB, Nouri S. Symptomatic heart disease in infants: Comparison of three studies performed during1969-1987. Pediatr Cardiol. 1995;16:216-22.
21. Rahman S, Ahmed MN, Rahmatullah KHI. The prevalence of congenital heart diseases diagnosed by Non-invasive technique- Ten years study in Bangladesh. DS (Child) HJ. 1992;8:5-15.
22. Hoffman JIE. Congenital heart disease: Prevalence and inheritance. Pediatr Clin North Am. 1990;37:25-43.
23. Fatema NN, Chowdhury RB, Chowdhury L. Prevalence of congenital heart disease among hospital live birth in a tertiary hospital of Bangladesh. CVJ. 2008;1:14-20.

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.