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"INCIDENCE AND PATTERNS OF CONGENITAL HEART DISEASES AMONG NEONATES ADMITTED IN SPECIAL NEW BORN CARE UNITS OF DISTRICT HOSPITAL NANDYAL, KURNOOL"

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ABSTRACT

Objective: To find out the pattern and incidence of congenital Heart defects among neonates in SNCU, District Hospital, Nandyal.

Methods: This is a retrospectic hospital-based study conducted over a period of 12 months in the Special new born care unit of District Hospital, Nandyal from 01th January 2021 to 31st December 2021. Neonates (new born up to 28 days of age) admitted are examined in the unit irrespective of their condition comprised the study population. They were first examined by the medical officer at the time of admission and subsequently by a pediatrician. Information of gender, weight, gestational age, were recorded on a predesigned Performa. After clinical examination, relevant investigations like ultrasonography, radiology, echocardiography, laboratory and genetic studies were done to confirm diagnosis if it was needed.

Results: Out of 2185 total admissions, 51 (2.28%) neonates were having congenital heart defect. Of them, 23 (45.1%) were male and 28 (54.90%) females. CHD was observed in 76% full-term and 24% pre-term infants. CHD was observed in 32 infants weighing >2,500 g (64% of corresponding birth weight infants); 17 weighing 1,500 to 2,500 g (34%); and 1 weighing <1,500 g (2%). The incidence of CHD was higher in the full-term group. However, the incidence of complex CHD in full-term neonates was high.

Conclusion: Findings from our study suggest that the recent incidence and disease pattern of CHD might have changed for both complex and simple forms of CHD in District Hospital, Nandyal.

KEYWORDS : Incidence, Congenital heart.

INTRODUCTION

Congenital heart disease (CHD) is a common cause of perinatal morbidity and mortality and many of cases are associated with extracardiac anomalies[1-4]. With the feasibility of fetal echo cardiography, remarkable changes have occurred in the incidence of hemodynamically significant CHD. Antenatal imaging studies have improved the care and outcome for selected fetuses with severe cardiac malformations. A few studies have reported on the impact of fetal echocardiography with regard to the incidence of significant or complex CHD[5-7]. Usually, cases with severe structural cardiac anomaly could be detected relatively easily on fetal echocardiography and patients could be referred to the tertiary centre before delivery, by which the CHD pattern in secondary and tertiary medical referral centres might have changed[8]. However, cases with minor defects might be neglected on fetal imaging study and the incidence of non-complex CHD is expected not to have changed. However, few population-based reports on recent incidence of CHD focused on simple CHD have been published. The incidence of simple forms of CHD at secondary referral medical centres might be more valuable because patients with period.

We attempted to assess the recent incidence and trends of CHD at a single neonatal care unit of the secondary referral medical centre in District Hospital, Nandyal.

MATERIALS AND METHODS

Retrospective analysis of the medical records of a 1-year period (January 2021 to December 2021) was performed in a Special New Born Care Unit (SNCU) District Hospital, Nandyal which is a secondary referral medical centre in Kurnool. The number of patients admitted to the SNCU during the one-year period was 2185. A total of 51 patients (23 males, 28 females) underwent echocardiography for various reasons. The male to female ratio of patients with CHD (n=51) was 0.82:1 and the reasons for admission included prematurity care, respiratory distress syndrome, necrotizing enterocolitis, apnea, and murmur, hyperbilirubinemia, transient tachypnea of the new born, meconium aspiration, sepsis, gastroenteritis.

In this study, all the patients included were infants only that are younger than 1 month after birth and we regarded the lesion of CHD as a simple one if the lesion has left to right shunt that does not cause cyanosis such as ASD, ventricular septal defect (VSD), PDA or a non-critical obstructive lesion such as mild to moderate PS. On the contrary, a lesion that has severe morphologic abnormality and leads to cyanosis was regarded as a complex CHD such as hypoplastic left heart syndrome (HLHS), transposition of great arteries (TGA), double outlet of right ventricle (DORV), etc. In order to avoid double counts, cases with multiple types of lesions were categorized into one disease that is hemodynamically the most important.

RESULTS

For comparisons of subgroups of patients diagnosed with CHD, we speculated on the total number of patients according to gestational age, birth weight, and other clinical characteristics. Among the 813 premature infants with gestational age less than 37 weeks, 12 cases (1.48%) had CHD, whereas among the 1,371 full-term patients, 39 cases (2.84%) had CHD. In accordance with the proportion of each group, total incidence of CHD was higher in full-term patients (Fig. 1).

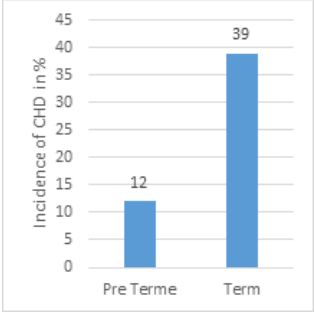

Fig.1 Incidence of CHD in pre-term & full term

When patients were categorized according to their birth weight (≥2,500 g, 1,500 to 2,500 g, <1,500 g), the incidence of CHD was highest in the subgroup of birth weight greater than 2,500g, (64%), 17 weighing 1,500 to 2,500 g (34%) and 1 weighing <1,500 g (2%). Hence, the incidence of CHD was higher in average birth weight groups than in low-birth-weight groups (Fig. 2).

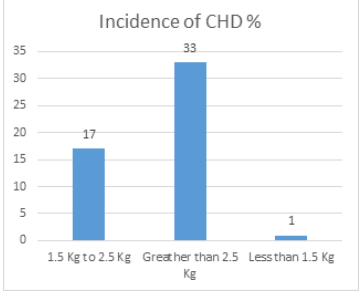

Fig.2 Incidence of CHD based on birth weight.

Diagnoses of CHD were as follows: ASD (n=35, 68.6%), VSD (n=5, 9.8%), and PDA (n=14, 27.4%). There were two cases in total anomalous pulmonary venous return (TAPVR). One patient with TAPVR revealed the abnormal drainage was supracardiac type and the other infracardiac type. There was one case of tetralogy of fallot. Incidence of complex CHD was higher in full-term neonates (n=3, 5.8%). (Table 1, Fig.3)

Table.1 Incidence of each type of CHD

Congenital Heart disease	Number	% of Total
ASD	23	45.10%
VSD	5	9.80%
PDA	14	27.45%
TAPVC	2	3.92%
TOF	1	1.96%
PFO	6	11.76%

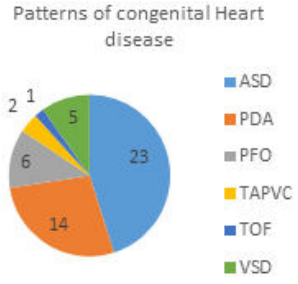

Fig.3 Patterns of congenital heart disease

Because the patients included in this study were patients in the SNCU, the majority of cases with CHD in this study were initially diagnosed within 5 days after birth.The most common symptom leading to study with echocardiography was cardiac murmur. Other symptoms included tachypnea and cyanosis after birth (Fig.4).

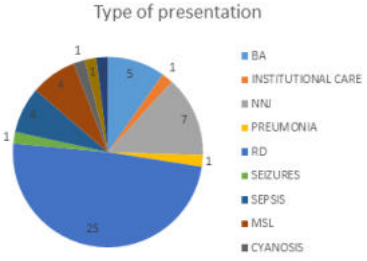

Fig.4 CHD Based on type of presentations

DISCUSSION

With regarding these findings, we attempted to determine recent trends of simple forms of CHD among patients of the SNCU based incidence of simple CHD. It is known that the incidence of CHD shows remarkable variation according to ethnicity and inclusion criteria of minor defects, mostly depending on the numbers of small muscular VSD[9].

Our findings of a gradual decrease in numbers of simple CHD might be combined with decreased numbers of extracardiac congenital anomaly or chromosomal abnormality, or owing to the trend of transferring pregnant mothers with high-risk pregnancy to tertiary medical centres. However, minor defects are usually not regarded as problematic or are not even detected before delivery and the incidence of complex cardiac anomaly has originally been low; our data imply that minor cardiac defects, as well as complex CHD lesions, might also have been decreased. Gradual decrease of numbers of extracardiac anomaly, including digits and cleft palates, may indirectly implicate that structural anomaly might have been aborted in the early stage of gestation. Our observation shows that the overall incidence of CHD was higher in the average birth weight group.

That the incidence of complex CHD was higher in full-term neonates (n=39, 76%) in our study is quite interesting. Several studies have reported higher incidence of CHD in premature or low birth weight groups; however, we could find no reports showing that complex or ductal-dependent cardiac lesions are frequently found in full-term patients, compared with premature babies. Further study regarding this point with a larger patient population is needed.

Unlike previous studies [10-15], ASD accounted for the highest percentage, followed by VSD, and PS in order. This result is probably due to the fact that subjects of this study were all neonates. Usually, the incidence of CHD varies depending whether premature babies are included into the subjects or not. Hoffman and Kaplan[9] determined that the reasons for variability of the incidence of CHD and relative frequency of different major forms of CHD from study to study is dependent upon how early the diagnosis is made. If tiny muscular VSD present at birth and other trivial lesions were included, the incidence was increased. Regarding the timing of initial echocardiographic study on the patients included here, most of the patients were evaluated cardiac problem at their very early age after birth.

A recent study of the incidence of CHD in an Asian pediatric population showed higher incidence of PS and Tetralogy of Fallot (TOF), with lower incidence of left-sided obstructive lesions, TGA and tricuspid atresia, compared with western populations[16]. Results of our study also revealed lower incidence of left sided obstruction. And the incidence of TOF was extraordinarily low, which might imply that TOF can be diagnosed relatively easily during the fetal period.

This study has several limitations. All of the subjects of this study were inpatients only of the SNCU, and this was a retrospective single centre study. Since not all patients underwent echocardiography, minor cardiac defects might have been missed and the true incidence might be somewhat higher than that reported here. As we could not get detailed history of antenatal study with fetal echocardiography, we could not reveal the impact of fetal imaging to these changes of epidemiologic findings that might had affected. Finally, a secondary referral medical centre is not absolutely free from the selection bias of the patients either.

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