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FREQUENCY EVALUATION OF ACYNOTIC CONGENITAL HEART DEFECTS IN CHILDREN OF AGE UPTO 2 YEARS ON 2-D ECHOCARDIOGRAPHY

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ABSTRACT

Congestive heart failure (CHF) is a persistent, progressive disease that impairs the heart's capacity to pump blood. CHF is the stage in which fluid builds up inside the heart and allows it to move inefficiently. It is also referred to literally as "heart failure." An identification of CHD screening is critical; echocardiography is a non-invasive procedure, and advanced two-dimensional echocardiography techniques provide a systematic means to determine nearly all forms of CHD seen in both adults and infants. **Objective:** The aim of this research is to classify the prevalence of most common acyanotic congenital heart defects in children under the age of two who are referred to echocardiography, as well as to confirm the existence of disease on echocardiography. **Methodology:** Data of 60 children was evaluated. Informed consent was obtained from each patient guardian before inclusion in the study. It was an observational study being conducted in Aziz Bhatti Shaheed Teaching Hospital, Gujrat, Punjab, Pakistan. **Results:** There were 65% males (n=39) and 35% females (n=21). Echocardiography data was collected on a predesigned Performa. **Conclusion:** Early diagnosis of congenital heart abnormalities is important for careful treatment and the prevention of complications. The gold norm for diagnosis is a 2D-echo with Doppler.

Keywords: Ayanotic, Heart Defects, Echocardiography, Congenital.

INTRODUCTION

During fetal development, congenital heart disorders, also known as congenital cardiovascular abnormalities, are anatomical problems that occur as a result of faulty creation of the heart or major blood arteries (1). Heart defects are the most frequent congenital fetal abnormalities, accounting for approximately 25% of all congenital malformations. They are also responsible for a high incidence of infant mortality and morbidity, which is attributed to their prevalence (2,3). CHDs may manifest themselves at any age, ranging from infancy through the teenage years. It is believed that two-thirds of afflicted patients are very ill during the first year of birth, and only a small percentage of them survive to childhood, either via natural selection or through effective treatment or curative surgery (4). The majority of cases are asymptomatic and are found through regular medical examinations. Other signs and symptoms may include cyanosis, clubbing of the fingers, and even complete congestive heart failure. Its origin is unclear, although it seems to be complex in nature, including chromosomal abnormalities, maternal diabetes, smoking, teratogenic drugs, maternal infection during early pregnancy, and environmental variables, amongst other things (2).In both industrialized and developing nations, congenital cardiac disease is a leading cause of newborn mortality. As a result of early therapeutic abortion and surgical repair, the number of infants born with CHD has decreased in industrialized nations, and their survival has improved (4) On the other hand, in developing nations where health treatments are inadequate or only available to the affluent, the overwhelming majority of patients die or are misdiagnosed (5). Technical innovation has been at the forefront of pediatric cardiology's advancement since its inception. "Incorporation of echocardiography into standard diagnostic procedures was one of the most revolutionary moments in the field's development because it allowed for the visual recording of the heart's action as well as the understanding of the phenomenon of flow and hemodynamic consequences that are carried by some entities, which were previously impossible (6). When it comes to pediatric cardiology, echocardiography is the most often used non-invasive method. In fact, the morphological and functional results in congenital heart disease (CHD) in almost all cases, independent of the kind of CHD, may be described most thoroughly. Pediatric patients need a distinct approach to echocardiographic assessment from adults. This kind of assessment gives data on the location of your heart in the thorax, the atrial viscerum, the vein-atrial and the atrioventricular links, the relation between the ventricles, the ventricular/arterial connection and the relation of large arteries, etc (segmental analysis). The echocardiographic evaluation should also include a non-invasive assessment of the ventricular function needed to optimally treat patients with coronary artery disease before and after surgery (CAD). Pump indexes are the most commonly utilized markers for human ventricular mechanics (i.e., ejection fraction or fractional shortening). Unfortunately, they may give incorrect findings in some situations because of their dependence on loading conditions and heart rate. This means that echocardiographical indices, such as fiber shortening, or a velocity of circumference-related fiber shortening, should be used to better reflect the intrinsic myocardial contractility. (either fiber shortening, fiber reduction or rhythm-revised fiber shortening-finishing systolic stress relation). In addition, novel echocardiographic methods are being developed (for example, Doppler myocardial imaging, strain rate, and back-scatters) that may provide fresh insight into regional functional and textured myocardial findings, as demonstrated by a growing body of research. A longer length of time, such follow-up studies, is needed to properly evaluate its real effect on the clinical environment. (12) The incidence of adult congenital heart disease increases due to progress in surgical methods and diagnostic capabilities. Consequently, it is important for doctors to include non-invasive imaging methods to their exams in

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order to assess their patients. Although some of such patients get continuous cardiology follow-up, they may be new patients who do not know their cardiac history. Echocardiography has shown to be a helpful tool in this regard by developing improved technology and innovative methods, which has resulted in its substantial increase in usefulness. (13)

MATERIAL AND METHODS

It was an observational descriptive study, that was carried out at Department of Cardiology Aziz Bhatti Shaheed Teaching Hospital, Gujrat during the period from March 2021- June 2021 through Performa. 60 patients of up to 2 years of age presented in Cardiology department for echocardiography of both male and female genders were included in this study. All patients above 2 years of age were excluded from the study. Data Analysis The patients of CHDs were studied by entering the required data on a detailed Performa. The data was displayed in charts, graphs, and pie diagrams, and it was evaluated with the Statistical Kit for the Social Sciences (SPSS) program.

RESULTS

Out of total 60 participants, 65% were males while the other were female individuals (Table 6.1)

Table 6.1: Gender Distribution

Gender	Frequency	Percentage
Male	39	65%
Female	21	35%
Total	60	100%

Figure 6.1 Descripting the gender distribution ratio

Out of the total participants, only 18.3 % patients presented with Atrial septal Defect which is one of the fatal acyanotic congenital heart defect. (Table 6.2)

Table 6.2 Atrial Septal Defect

ASD	Frequency	Percentage
Yes	11	18.30%
No	49	81.70%
Total	60	100%

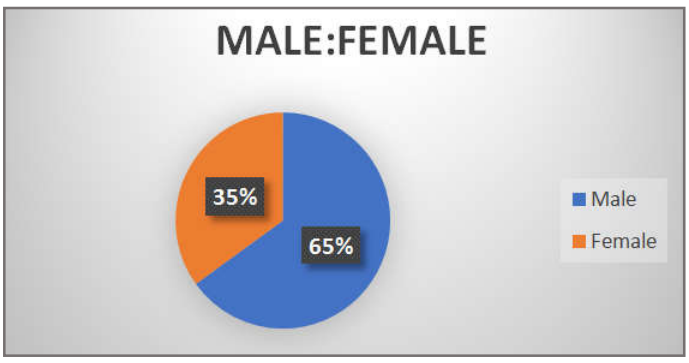
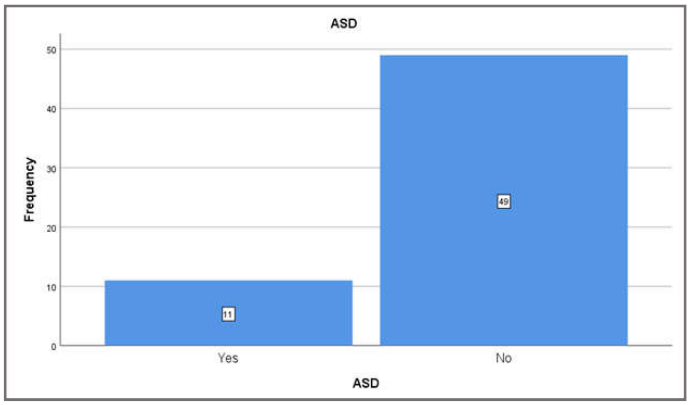


Figure 6.2 Graphical Representation for Frequency distribution of ASD



Out of the total 60 individuals, 63.3% participants were diagnosed with Ventricular septal defect which means to be most prevalent acyanotic congenital heart defect in children.

Table 6.3 Ventricular Septal defect frequency distribution

VSD	Frequency	Percentage
Yes	38	63.30%
No	22	36.70%
Total	60	100%

Figure 6.4 Graphical Representation for VSD frequency

Out of total participants, 42% individuals were diagnosed with patent ductus arteriosis, which is another acyanotic congenital heart defect. (Table 6.5)

Table 6.5: Patent ductus arteriosus frequency distribution

PDA	Frequency	Percentage
Yes	25	41.70%
No	35	58.30%
Total	60	100%

Figure 6.5 Graphical representation for Paten Ductus arteriosus

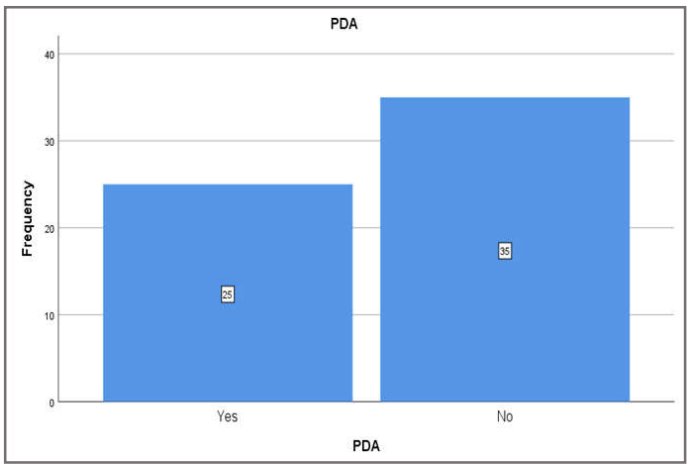


Table 6.6 Gender and Age Crosstabulation

			Age			
			1 to 6 months old	7 to 12 months old	13 to 18 months old	19 to 24 months Old
Gender	Male	Count	2	13	10	14
		% Within Gender	5.1%	33.3%	25.6%	35.9%
	Female	Count	1	8	6	6
		% Within Gender	4.8%	38.1%	28.6%	28.6%
Total		Count	3	21	16	20
		% Within Gender	5.0%	35.0%	26.7%	33.3%

Table 6.7: Gender and ASD Crosstabulation

			ASD		Total
			Yes	No	
Gender	Male	Count	7	32	39
		% Within Gender	17.9%	82.1%	100.0%
	Female	Count	4	17	21
		% Within Gender	19.0%	81.0%	100.0%
Total		Count	11	49	60
		% Within Gender	18.3%	81.7%	100.0%

Table 6.8: Gender and VSD Crosstabulation

			VSD		Total
			Yes	No	
Gender	Male	Count	25	14	39
		% Within Gender	64.1%	35.9%	100.0%
	Female	Count	13	8	21
		% Within Gender	61.9%	38.1%	100.0%
Total		Count	38	22	60
		% Within Gender	63.3%	36.7%	100.0%

Table 6.9: Gender and PDA Crosstabulation

			PDA		Total
			Yes	No	
Gender	Male	Count	19	20	39
		% Within Gender	48.7%	51.3%	100.0%
	Female	Count	6	15	21
		% Within Gender	28.6%	71.4%	100.0%
Total		Count	25	35	60
		% Within Gender	41.7%	58.3%	100.0%

Table 6.10: Age and Gender Crosstabulation

			Gender		Total
			Male	Female	
Age	1 to 6 months old	Count	2	1	3
		% Within Age	66.7%	33.3%	100.0%
	7 to 12 months old	Count	13	8	21
		% Within Age	61.9%	38.1%	100.0%
	13 to 18 months old	Count	10	6	16
		% Within Age	62.5%	37.5%	100.0%
	19 to 24 months old	Count	14	6	20
		% Within Age	70.0%	30.0%	100.0%
Total		Count	39	21	60
		% Within Age	65.0%	35.0%	100.0%

Table 6.11: Age and ASD Crosstabulation

			ASD		Total
			Yes	No	
Age	1 to 6 months old	Count	1	2	3
		% Within Age	33.3%	66.7%	100.0%
	7 to 12 months old	Count	5	16	21
		% within Age	23.8%	76.2%	100.0%
	13 to 18 months old	Count	3	13	16
		% within Age	18.8%	81.3%	100.0%
	19 to 24 months old	Count	2	18	20
		% within Age	10.0%	90.0%	100.0%
Total		Count	11	49	60
		% within Age	18.3%	81.7%	100.0%

Table 6.12: Age and VSD Crosstabulation

			VSD		Total
			Yes	No	
Age	1 to 6 months old	Count	3	0	3
		% within Age	100.0%	0.0%	100.0%
	7 to 12 months old	Count	12	9	21
		% within Age	57.1%	42.9%	100.0%
	13 to 18 months old	Count	10	6	16
		% within Age	62.5%	37.5%	100.0%
	19 to 24 months old	Count	13	7	20
		% within Age	65.0%	35.0%	100.0%
Total		Count	38	22	60
		% within Age	63.3%	36.7%	100.0%

Table 6.13: Age and PDA Crosstabulation

			PDA		Total
			Yes	No	
Age	1 to 6 months old	Count	1	2	3
		% within Age	33.3%	66.7%	100.0%
	7 to 12 months old	Count	8	13	21
		% within Age	38.1%	61.9%	100.0%
	13 to 18 months old	Count	9	7	16
		% within Age	56.3%	43.8%	100.0%
	19 to 24 months old	Count	7	13	20
		% within Age	35.0%	65.0%	100.0%
Total		Count	25	35	60
		% within Age	41.7%	58.3%	100.0%

To evaluate frequency of acyanotic congenital heart defects in infants and young children. Data of 60 children was evaluated. There were 65% males (n=39) and 35% females (n=21). Informed consent was obtained from each patient's guardian before inclusion in the study. Echocardiographic data was collected on a predesigned Performa. The relative frequencies of acyanotic congenital heart defects, Ventricular septal defect 63.3% followed by atrial septal defect 18.3% and Patent ductus atriosus 41.7 % were the commonest acyanotic congenital heart defects. The most common acyanotic defect in our study was the septum ventricular defect with the incidence of 63.3 percent. Similar to the findings of the second Belgian research (Abraham et al., 2002). This incidence was 48.4 per cent higher than in Jordan (Amro, K., 2009). In Turkey, 22.8 percent was higher than incidence (Karkmaz et al., 2015). Differences between our numbers and those in our literature may have contributed to factors such as the diagnosis standard gold, delayed diagnosis of VSDs, which allowed further VSDs to be spontaneously closed, the failure to recognize minimal or minor sevenfold defects by a primary care practitioner and limited time for my study. A further common defect in preterm infants is the patent ductus arteriosus (PDA). In the current study, the second common acyanopathy in Aziz Bhatti Hospital, Gujrat, was PDA, which was 41.7% of children In Turkish (Korkmaz et al., 2015), Yemen (Saleb, H.k., 2005), Jordan have been conducting similar studies (Amro, K., 2009) It may be because of the high rate of preterm deliveries that the frequency of PDA increases. Atrioventricular septal defect (ASD) was the third most common acyoantic heart defect in our research, accounting for 18.3% of all cases. The findings of additional research, including those performed in Turkey (Korkmaz et al., 2015), Yemen (Saleb, H.k., 2005), and Jordan (Amro, K., 2009), revealed that the prevalence of ASD was 63.3 percent, 15.8 percent, and 13.6 percent, respectively. Because my research criteria included children up to the age of two and the fact that ASDs are asymptomatic in childhood, the incidence of ASDs is more likely to be lower than in previous studies. Due to the fact that ASD is often asymptomatic and has murmurs that are generally mild, these abnormalities frequently do not result in an early identification of the condition. Thus, many of these instances manifest themselves throughout adulthood.

CONCLUSION

Finally, this research provides a summary of the incidence of acyanotic heart disease congenital at Aziz Bhatti Hospital Gujrat. The ventricular septal defect in congenital heart failures is seen in the majority of individuals with acyanotic congenital cardiac illness. Early identification of congenital cardiac abnormalities is very important for appropriate treatment in order to prevent consequences. 2D-echo provides a gold standard for diagnosis with Doppler examination.

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