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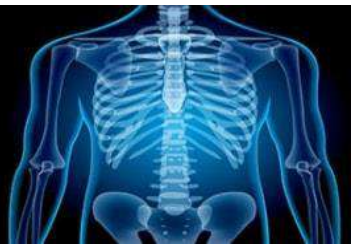

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Antenatal detection of congenital heart disease: An ultrasonographic study

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Abstract
Background: CHD is the most common congenital malformation in live births with an incidence of around 1% in general population. The present study was conducted detect congenital heart disease with ultrasonography.
Materials & Methods: This study was conducted on 28 cases of congenital heart disease recorded with USG. Antenatal ultrasound examinations were performed between 13 and 26 weeks.
Results: Maximum patients were with gestation age of 13-17 weeks (12) followed by 17-21 weeks (10) and 21-26 weeks (6). The difference was non- significant (P> 0.05). Among CHD various disorders were atrioventricular septal defect (4), simple coarctation of the aorta (3), double-inlet or -outlet ventricle (4), hypoplastic left heart syndrome (5), simple transposition of the great arteries (TGA) (6), tetralogy of Fallot (4) and truncus arteriosus (2). The difference was non- significant (P> 0.05).
Conclusion: Antenatal examination may proved fruitful by in detection of CHDs. Most common was simple transposition of the great arteries.

Keywords: Atrio-ventricular septal defect, congenital heart disease, Truncus arteriosus

Introduction
Congenital heart defect (CHD) is defined as defect in the heart and major blood vessels, including structural, chromosomal, genetic, biochemical defects and malformations. CHD is the most common congenital malformation in live births with an incidence of around 1% in general population [1]. The incidence of critical CHD (needing intervention or operation within 1 month after birth) is around 2 per 1000. CHDs remain a leading cause of infant mortality accounting for up to 40% of all deaths from congenital defects. Up to 7.5% of the infant mortality in the developed world is reported from CHDs [2]. Congenital heart defects are serious and common conditions that have significant impact on morbidity, mortality, and healthcare costs in children and adults. Continental variations in birth prevalence have been reported, from 6.9 per 1000 births in Europe to 9.3 per 1000 in Asia [3].
Known maternal risks include maternal smoking during the first trimester of pregnancy. Exposure to secondhand smoke has also been implicated as a risk factor. Maternal binge drinking is also associated with an increased risk of congenital cardiac defects and the combination of binge drinking and smoking may be particularly dangerous. A greater risk of congenital heart defects is also seen in women who both have a high BMI [4]. The present study was conducted detect congenital heart disease with ultrasonography.

Materials & Methods
This study was conducted in the department of Radio diagnosis. It comprised of 28 cases of congenital heart disease recorded with USG. The study protocol was approved from institutional ethical committee and all patients were informed and written consent was obtained. Antenatal ultrasound examinations were performed between 13 and 26 weeks. All cases with atrio-ventricular septal defect, simple coarctation of the aorta, double-inlet or -outlet ventricle, hypoplastic left heart syndrome, simple transposition of the great arteries (TGA), tetralogy of Fallot and truncus arteriosus were evaluated. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

Results

Table 1: Gestational wise distribution of patients

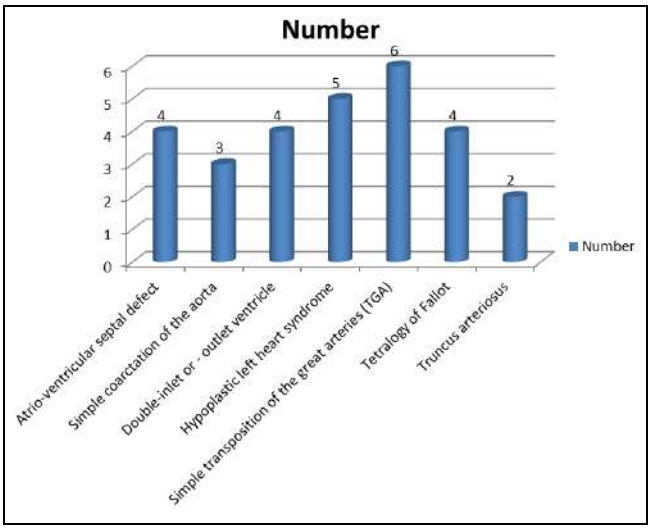
Gestational age (Weeks)	Number	P value
13-17	12	0.52
17-21	10	
21-26	6	

Table 1 shows that maximum patients were with gestation age of 13-17 weeks (12) followed by 17-21 weeks (10) and 21-26 weeks (6). The difference was non- significant (P> 0.05).

Table II: Various congenital heart diseases

S. no	CHD	Number
1.	Atrio-ventricular septal defect	4
2.	Simple coarctation of the aorta	3
3.	Double-inlet or - outlet ventricle	4
4.	Hypoplastic left heart syndrome	5
5.	Simple transposition of the great arteries (TGA)	6
6.	Tetralogy of Fallot	4
7.	Truncus arteriosus	2

Table II shows that among CHD various disorders were atrioventricular septal defect (4), simple coarctation of the aorta (3), double-inlet or -outlet ventricle (4), hypoplastic left heart syndrome (5), simple transposition of the great arteries (TGA) (6), tetralogy of Fallot (4) and truncus arteriosus (2). The difference was non- significant (P> 0.05).



Graph I: Congenital heart diseases

Discussion

Congenital heart defect (CHD) may be defined as an anatomic malformation of the heart or great vessels which occurs during intrauterine development, irrespective of the age at presentation. CHD is three times more common than identifiable chromosomal anomalies and four times more common than neural tube defects. It is the most life-threatening defect in the first month of life, accounting for approximately 20% of perinatal deaths. CHD is part of an identifiable syndrome or chromosomal defect in some patients, but in the majority it appears spontaneously with no identifiable risk factors [5]. The present study was conducted detect congenital heart disease with ultrasonography.

In this study, maximum patients were with gestation age of 13-17 weeks (12) followed by 17-21 weeks (10) and 21-26 weeks (6). Tegnander *et al*. [6] found that the overall birth prevalence of CHD from 1993 to 2002 in Victoria was 7.8/1000. The antenatal detection rate for the seven selected defects from 1999 to 2002 was 52.8%. All but 4.8% of the cases had an ultrasound examination at >13 weeks' gestation. Antenatal detection was highest for hypoplastic left heart syndrome (84.6%) and lowest for simple TGA (17.0%).

We found that among CHD various disorders were atrioventricular septal defect (4), simple coarctation of the aorta (3), double-inlet or -outlet ventricle (4), hypoplastic left heart syndrome (5), simple transposition of the great arteries (TGA) (6), tetralogy of Fallot (4) and truncus arteriosus (2).

Congenital heart defects may be classified into acyanotic and cyanotic depending upon whether the patients clinically exhibit cyanosis. In cyanotic congenital heart defects systemic venous blood bypasses the pulmonary circulation and gets shunted across into the left side of the heart. Thus, there is systemic arterial desaturation. By definition, cyanotic CHD does not include cyanosis due to intrapulmonary right-to-left shunting and pulmonary venous desaturation secondary to congestive heart failure [7].

Most of the known causes of congenital heart disease are sporadic genetic changes, either focal mutations or deletion or addition of segments of DNA [8]. Large chromosomal abnormalities such as trisomies 21, 13, and 18 cause about 5–8% of cases of CHD, with trisomy 21 being the most common genetic cause. Small chromosomal abnormalities also frequently lead to congenital heart disease, and examples include microdeletion of the long arm of chromosome 22 (22q11, Di George syndrome), the long arm of chromosome 1 (1q21), the short arm of chromosome 8 (8p23) and many other, less recurrent regions of the genome, as shown by high resolution genome-wide screening [9].

Conclusion

Antenatal examination may proved fruitful by in detection of CHDs. Most common was simple transposition of the great arteries.

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