The frequency of congenital heart diseases among premature neonates

La frecuencia de las cardiopatías congénitas entre los recién nacidos prematuros

Sinan Abdulrazzaq Ibrahim*, M.B.Ch.B., F.I.C.M.S(ped), F.I.C.M.S.(cardio), Department of pediatrics, College of Medicine, Al-Nahrain University, Iraq, email: sinanabdulrazzaq1980@gmail.com
Ruaa Hadi Ali Alkindi, M.B.Ch.B, F.I.C.M.S. pediatrics specialist in Department of paediatrics /Al-Emamein Alkadhmein Medical city, Iraq, email ruaalkindi@gmail.com
Dhamem Yasir Breasm, F.I.B.M.S. Pediatrics, specialist in Al-Karama Teaching Hospital, Iraq, https://orcid.org/0000-0001-8510-5263, email: dhamemyasir@gmail.com
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Abstract

Background: Major congenital heart diseases(CHD) accounts for nearly one third the incidence among live births a prevalence ranging from 4 to 50 per 1,000. even higher in cases of premature children. Aim of study to find the frequency of congenital heart disease in premature neonates. patients and methods: 250 neonates are enrolled in the study who admitted to the pediatric ward in AL-Emamain AL-Khadhumain Medical city. The neonates were collected during the period from 15th of November, 2018 to 7th of January, 2019, The neonates with suspicion of congenital heart disease were sent for Echocardiography, and looking for presence or absence of the disease. After completing data collection (name, gender, the age at delivery, presence and type of C.H.D., maternal exposure to drugs, if they are dead or alive), neonates with patent ductus arteriosus excluded from the study. Results & Conclusion: the frequency was 11 (4.4 %) infants with CHDs, a cyanotic congenital heart disease were more common than cyanotic congenital heart disease also embryonic exposure to maternal drugs during cardio genesis period can be a risk factor to CHD in a premature neonates, and the incidence were higher in males than female.

Key words: congenital heart disease, Premature, frequency

Resumen

Antecedentes: las enfermedades cardíacas congénitas importantes (CC) representan casi un tercio de la incidencia entre los nacidos vivos, una prevalencia que varía de 4 a 50 por 1.000. incluso mayor en los casos de niños prematuros. Objetivo del estudio para encontrar la frecuencia de cardiopatías congénitas en recién nacidos prematuros. pacientes y métodos: 250 recién nacidos están inscritos en el estudio que ingresaron en la sala de pediatría en AL-Emamain AL-Khadhumain Medical city. Los neonatos fueron recolectados durante el período del 15 de noviembre de 2018 al 7 de enero de 2019.Los neonatos con sospecha de cardiopatía congénita fueron enviados para Ecocardiografía, buscando presencia o ausencia de la enfermedad. Después de completar la recolección de datos (nombre, sexo, edad al parto, presencia y tipo de DCH, exposición materna a medicamentos, si están vivos o muertos), los neonatos con conducto arterioso persistente excluidos del estudio. Resultados y conclusión: la frecuencia fue de 11 (4,4%) lactantes con cardiopatía coronaria, una cardiopatía congénita cianótica era más común que la cardiopatía congénita cianótica, además la exposición embrionaria a fármacos maternos durante el período de cardiogénesis puede ser un factor de riesgo de cardiopatía coronaria en recién nacidos prematuros, y la incidencia fue mayor en hombres que en mujeres.

Palabras clave: cardiopatía congénita, prematura, frecuencia.

Introduction

Congenital heart disease (CHD) is one of the most common congenital defects and accounts for nearly one-third of all major congenital anomalies[1]. Some population- based epidemiological studies on CHD have indicated a prevalence ranging from 4 to 50 per 1,000 live births[2,3] nd the incidence is even higher in cases of premature children, stillbirth or spontaneous abortion[4]. CHD in children continues to be an important cause of death[5], and constitutes a potential risk of sudden cardiac death in adulthood even with mild cardiac lesion[6]. The character of the heart sounds and the presence and character of any murmurs further narrow the differential diagnosis. The final diagnosis is then confirmed by echocardiography, CT or MRI, or cardiac catheterization[7].

Acyanotic congenital heart disease includes left-to-right shunts resulting in an increase in pulmonary blood flow (patent ductus arteriosus [PDA], ventricular septal defect [VSD], atrial septal defect [ASD]) and obstructive lesions (aortic stenosis, pulmonary stenosis, coarctation of the aorta), which usually have normal pulmonary blood flow[8].

Cyanotic congenital heart disease occurs if there is right-to-left shunt, Cyanosis, occurs when approximately 5 g/100 mL of reduced hemoglobin is present in systemic blood. The most common cyanotic defects are the five Ts: Tetralogy of Fallot Transposition of the great arteries, Tricuspid atresia. Truncus arteriosus, Total anomalous pulmonary venous return[8], severe types of congenital heart problems are often detected while the baby is still in the womb or within the first few weeks of life[9].

Fetal echocardiogram (during pregnancy): This test shows moving pictures of a baby's heart and how it is working as early as 16-18 weeks into pregnancy. It is usually used if congenital heart disease runs in your family, or if there are other factors that make a heart problem more likely[10].

our child's heart team should talk with you about treatment options and what to expect. Treatment may include a combination of (Medications, Cardiac catheterization, Devices that are placed or implanted in the heart)[11].

Aim of the study

to study the frequency of congenital heart diseases in premature neonates.

Patients and methods

250 neonates were randomly enrolled in the study who were admitted to the pediatric ward in AL-Emamain AL-Khadhumain Medical city. The neonates were examined during the period from 15th of November, 2018 to 7th of January 2019, the neonates with suspicion of congenital heart disease were sent for Echocardiography, after completing data collection, (name, gender, gestational age, type of C.H.D., maternal exposure to drugs e.g. anticonvulsant, antibiotics) neonates with PDA were excluded from the study. The result calculated by using SSPS program of statistics version 13 and P value is significant if was less than 0.05 2.3

Results

From the total 250 neonates only 11 (4.4%) having cardiac defect. As seen in table-1.

Table 1. The percentage and frequency of cardiac defect among the neonates.

Cases	Frequency	Percentage %
Cadiac defect	11/250	4.4%
No cardiac defect	239/250	95.6%
Total	250	100%

Among the neonates who have cardiac defect that 8 (72.7%) of them have ASD, 2 (18.2%) of them have VSD, and 1 (9.1%) of them have TOF, as seen in table-2

Table 2. The percentage and frequency of cardiac defect

Type of CHD	Frequency	Percentage
ASD	8/11	72.7%
VSD	2/11	18.2%
TOF	1/11	9.1%
Total	11	100%

The most common gestational age was between 31-32 week seen in 5 (45.6%) neonates , as in table-3.

Table 3. percentage of cardiac defect according to gestational age.

Gestational Age	Frequency	Percentage
25-28 week	3/11	27.2%
29-30 week	3/11	27.2%
31-32 week	5/11	45.6%
Total	11	100%

the relationship between the type of CHD and the gender, the male to female ratio was 1.7: 1 , as seen in table-4.

Table 4. Type Of CHD (a cyanotic or cyanotic) according to Gender

Type of CHD		Male	Female	Total
A cyanotic	ASD	5	3	8
	VSD	1	1	2
cyanotic	TOF	1	0	1
Total		7	4	11

We found that 6(54%) of neonates their mothers had taken drugs during pregnancy and P value = (0.073) which is not significant. As seen in table-5

Table 5. The relation between drugs taken by mothers & occurrence of CHD.

Presence of CHD	Drug taken	No drugs taken	Total
Have CHD	6(54%)	5(46%)	11
Don't have CHD	26	213	239
Total	32	218	250

The most common cardiac defect noticed in neonates whose mother taken drugs, was a cyanotic CHD 5(45%) than cyanotic type, as seen in table-6

Table 6. type of CHD according to exposure to drugs

Type of CHD	drugs		percentage
	yes	No	
cyanotic	1	0	1(9%)
acyanotic	5	5	5(45%)
Total	6	5	6/11(54%)

No death recorded among neonates included in the study.

Discussion

Prevalence of CHDs 4.4% was significantly higher than the reported birth prevalence of CHDs in term neonates 0.6 – 1% (6-10/1000 births)[12,13]. Importantly, the subset of severe CHDs were almost five-fold more likely in very/extremely premature neonates when compared with term neonates. and 7.4/1000 birth hospitalizations in pre term infants in other study[15], the current study found that the most frequent cardiac defect is ASD 72.2 % and least frequent is TOF 9.1% and this correlate with the other studies[15]. And this indicate that a cyanotic CHD are more common that the cyanotic, regarding the frequency of CHD according to the gestational age (45.6% at 31-32 weeks, 27.2% at 25-28 weeks and 27.2% at 29-30 weeks GA). These data highlight the substantial differences that small increments of prematurity can have on outcomes in neonates with CHD, and may influence future decisions surrounding surgical interventions, medical management, and palliative care[15].

The relation between the gender and type of CHD, we found that the male was more than female, which was the same results as in the other studies[15]. Also we try if a specific gender is related to a specific type of CHD and it was not significant (p-value = 0.073).

The effect of embryonic exposure to maternal drugs during cardio genesis, and the evidence suggests that maternal use of ethanol, anticonvulsants, lithium, and exogenous female hormones may increase the risk of congenital heart disease, the evidence indicates that the vast majority of heart malformations cannot be attributed to these pharmacologic agents, and this result was the same result that obtained by another research[16].

The mortality rate of our study was 0%, and it was the same result to the research[15], reports suggesting that larger ASDs actually exacerbate underlying chronic lung disease of prematurity[17,18].

Conclusions

The frequency was about 4.4% and the a cyanotic congenital heart disease were more common than cyanotic, and the embryonic exposure to maternal drugs can be a risk factor to CHD in a premature neonates, and also the frequency of congenital heart disease were higher in males than female.

Recommendations

It is worthy to postpone premature delivery as possible as can, there is a great need for further and larger studies to assess the incidence, follow up and long term outcome of neonates with CHD.

Patients' consent

Informed written consent was taken from the parents of the children to participate in this study and for publication of the clinical details.

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Conflicts of interest The authors have no conflict of interest to declare.

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