Journal of Current Medical Research and Opinion
Received 18-06-2024 | Revised 19-06-2024 | Accepted 10-07-2024 | Published Online 13-07-2024

DOI: https://doi.org/10.52845/CMRO/2024/7-7-17 ISSN (O) 2589-8779 | (P) 2589-8760
CMRO 07 (07), 3226-3233 (2024) www.cmro.in
Original Research

Neonatal Screening of Congenital Heart Disease in Premature Unit Dose It Save Life

Dr Iman Al Obaidi MD[1], Dr Kefah Al Anie MD[2], Mr Sattar Al Tameemi[3], Miss Ibtsam Ibrahiem [4], Dr Asan Nyazze[5], Dr Wisam Al Tameemi[6]

E-mail coauthors:
mercyorg21@gmail.com

Abstract:

Background: Congenital heart disease in consider as important cause of mortality and morbidity in newborn **Objectives:** To show the impact of neonatal Echocardiography screening programmer on fate mortality morbidity of neonate with CHD .establish relationship between neonatal CHD and certain parameter like cyanosis murmur gestational age congenital malformation syndromes, Mode of Delivery.

Materials and methods: The study started between 1-7-2022 till 1-4-2022.Was (519) neonate were below age 28days screened for CHD in premature unit of 2 hospital pediatric and maternity hospital. All newborn babies were examined thorough looking for congenital malformation . syndromes, central and peripheral cyanosis , cardiac murmur. With questioner about gestational age . mode of delivery .All were evaluated by Echocardiography done by specialist doctor.

Results: The results finding the (58%) were male neonate .(42%) were female neonates(92%) of neonates age between 1-10days .(5%) between 10-20days ,3% were between 20-30days .Incidence of CHD were(31%)Incidence of critical cyanotic CHD 7/1000 (D TGA ,DORV ,Truncus arteriosus ,Ebstein malformation of TV).Incidence of a cyanotic CHD almost (30%).The most common type of A cyanotic CHD PFO 12%, PDA 9% without pulmonary hypertension .3% PDA with Pulmonary hypertension ,ASD 3.8% , 89% were full term . 60% were delivered by caesarian section.(2%)were having Down syndrome. Klippel fiel syndrome. Anencephaly , hydrocephaly (27%) of neonate with syndrome having CHD (28%) Of non syndromic neonate have CHD.

Conclusion: The study concluded that the Echocardiography is cornerstone for quick accurate diagnosis of CHD It can save neonates life .

Keywords: Neonatal Screening, Congenital Heart Disease, Premature Unit.

Introduction:

Congenital heart disease (CHD) is the most common congenital problem in children accounting for nearly 25% of all congenital malformations [(1)]. undiagnosed CHD can lead to life threatening cardiovascular issues which are the primary causes of death in infants, so screening newborns' cardiac health is vital[(2)]. Clinical examinations, cardiac auscultation even if it is performed in newborns however the use of Echo for diagnosing CHD in newborns should be mandatary especially in asymptomatic, non-syndromic neonates even when no cardiac murmurs are present although it is a subject of debate[(3)]. Congenital heart disease (CHD) is a leading cause of infant mortality, accounting for over 40% of deaths from congenital Defects [(4)].

Materials and methods:

The study started between 1-7-2022 till 1-4-2022.(654) neonates were below age 28days screened for CHD in premature unit of 2 hospital pediatric and maternity hospital .All newborn babies were examined thorough looking for congenital malformation . syndromes, central and peripheral cyanosis , cardiac murmur. With questioner about gestational age . mode of delivery .All were evaluated by Echocardiography done by specialist doctor.

Results:

Table 1: Distribution of participants according to the time of examination, body weight , gender ,mode of delivery , Gestational age.

		Frequency N=654	Percent %
Age (days)	≤ 10 days	615	94%
	11- 20 days	26	3%
	21 - 30 days	13	1%
Gender	female	294	45%
	male	358	55%
Weight (kg)	≤2.4 kg	139	36.5%
	2.5 -4.0 kg	395	60.3%
	>4Kg	20	3%
Mode of delivery	NVD	284	43.3%
	CS	370	56.6%
Gestational age	Full term 37-40wk.s	410	62.6%
	Preterm <37wk.s	199	30.4%
	Very preterm 28-37wk.s	45	6.8%

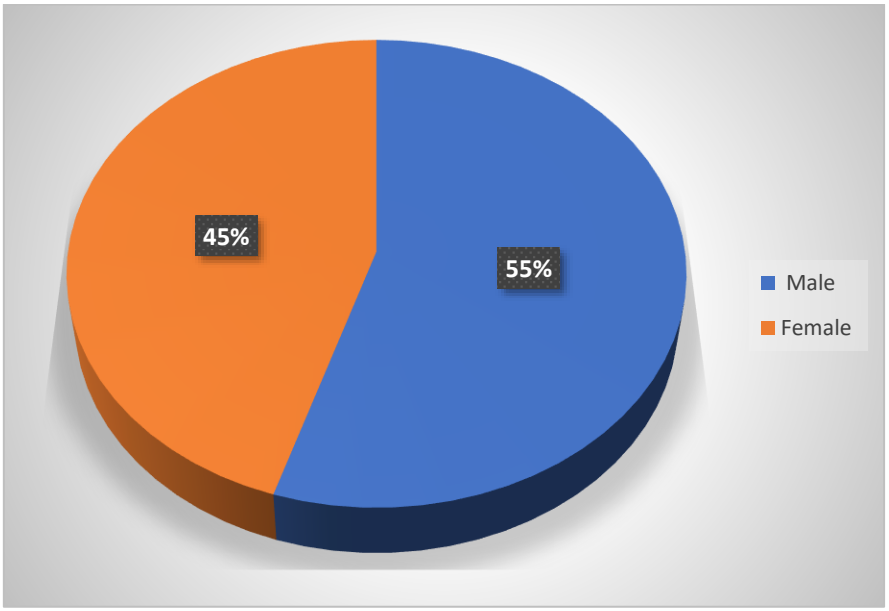


Figure (1): Distribution of participants according to gender.

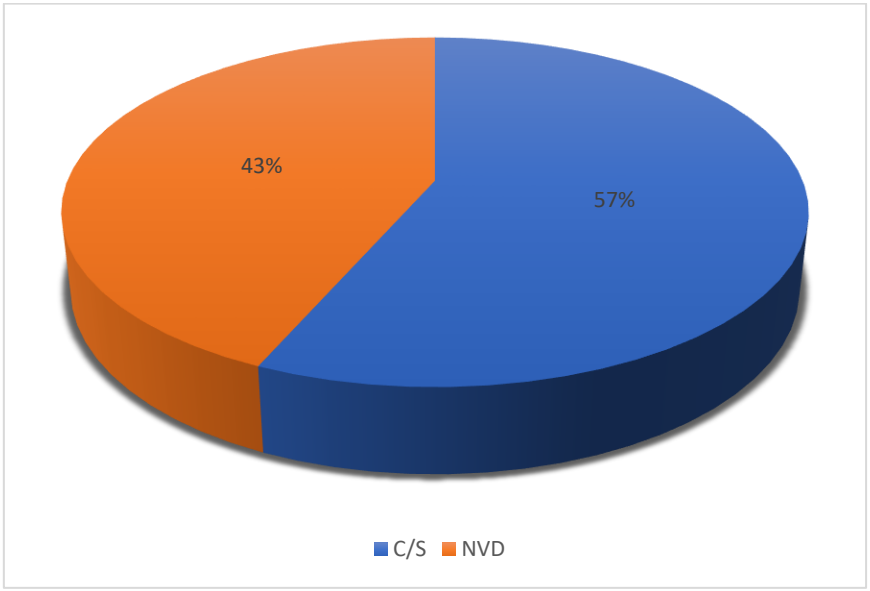


Figure (2): Distribution of participants according to mode of delivery.

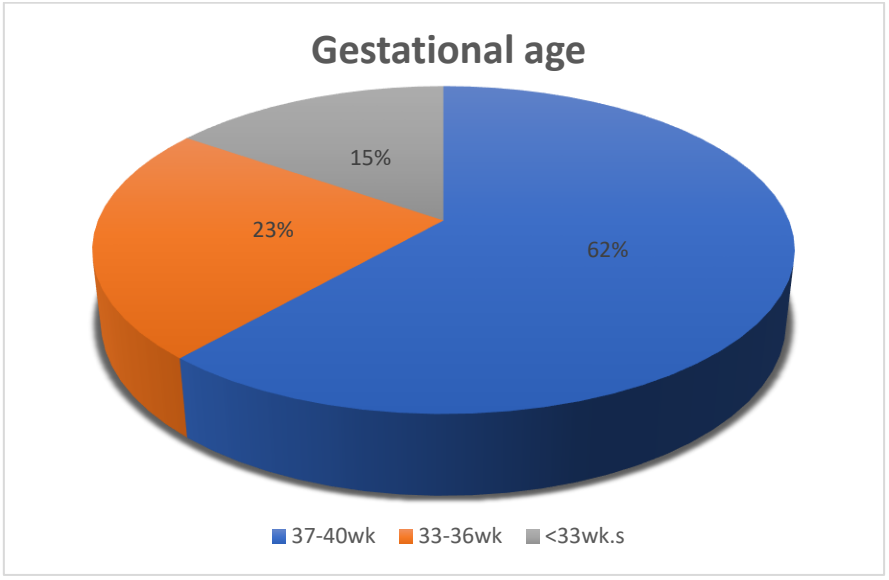
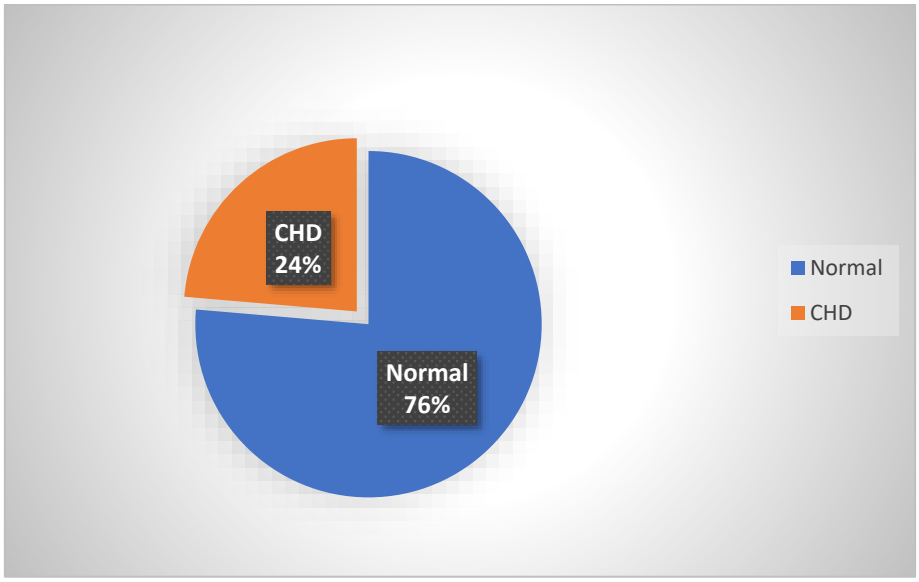
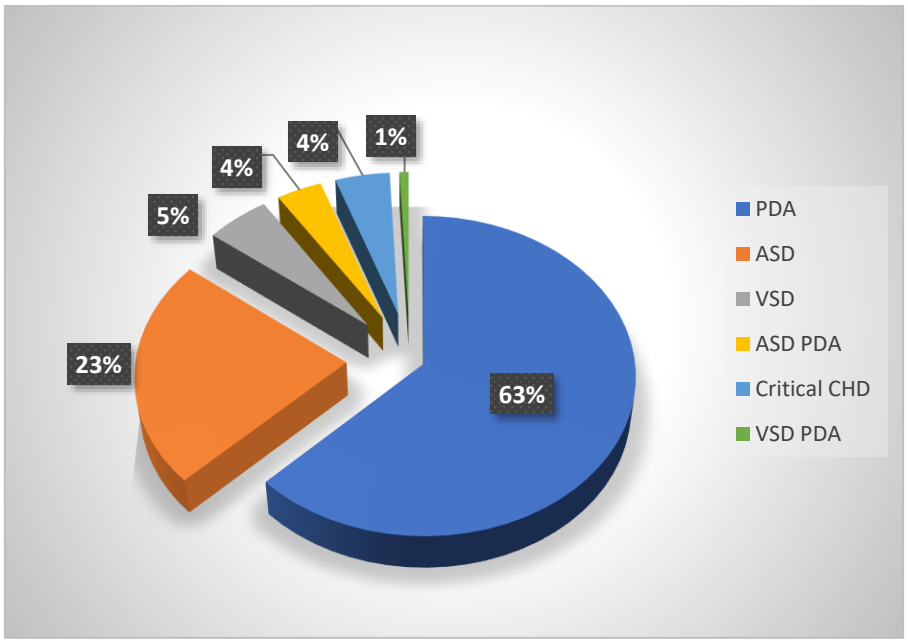


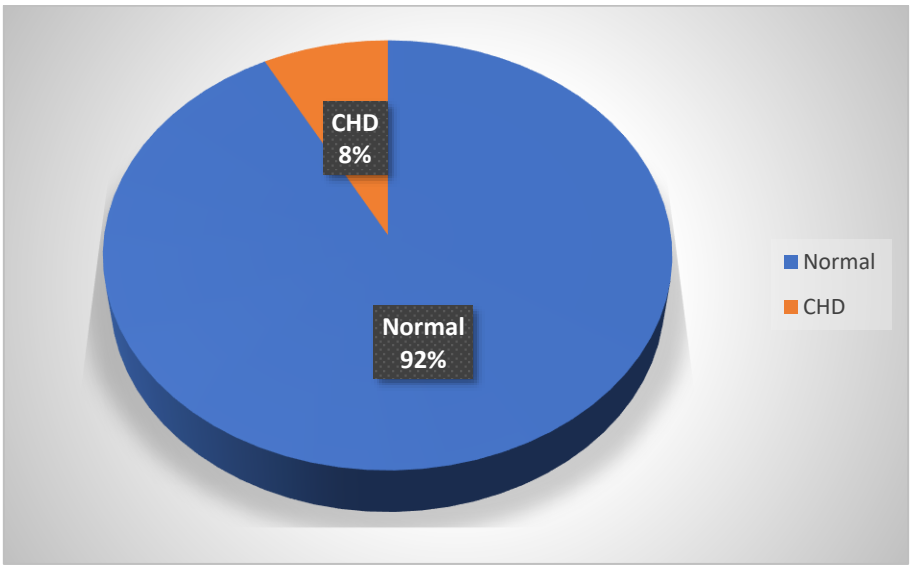
Figure (3): Distribution of participants according to gestational age.



Figure(4):Distribution of participants according to CHD



Figure(5):Distribution of participants according type to CHD



Figure(6):Distribution of CHD post 6 mn.s re examination

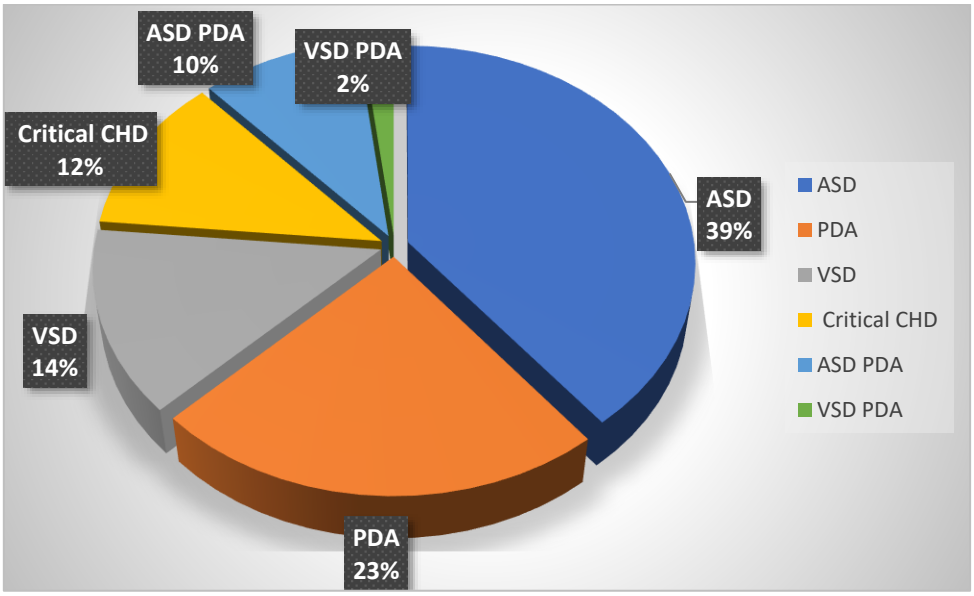


Figure (7): Distribution of participants according to CHD 6mn.s 1 st examination

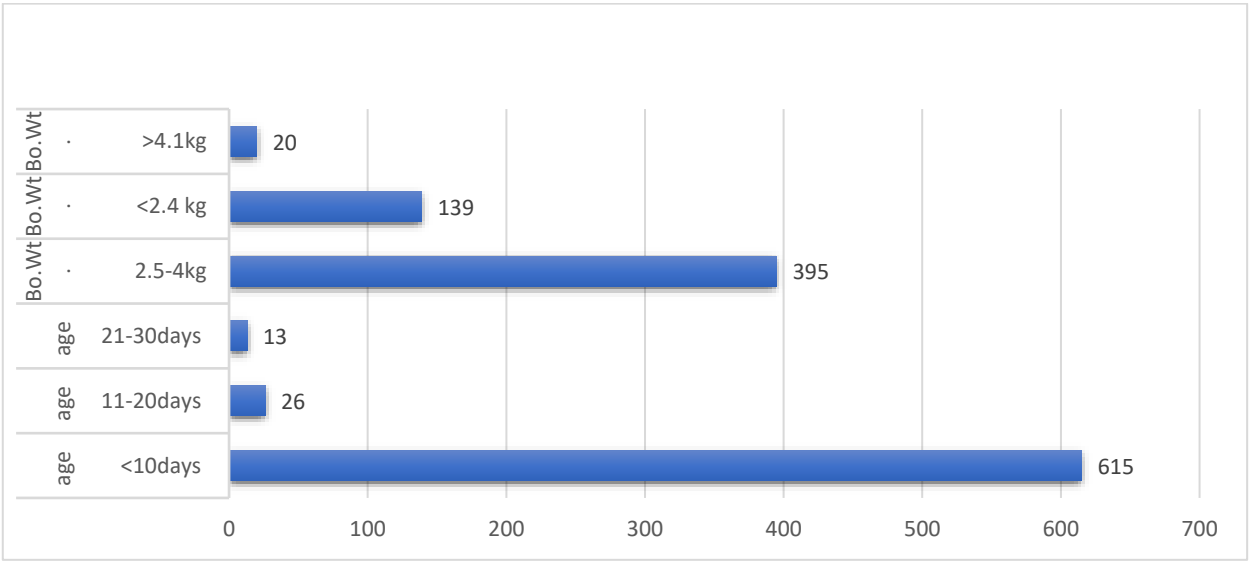


Figure (8): Distribution of participants according to their age, body weight No (654).

Table (2): Distribution of the participant according to type size of defect

PDA	small	60(9.1%)
	moderate	20(3%)
PDA PH	large	12(1%)
ASD	Small	17(2.5%)
	moderate	13(1.9%)
VSD	Moderate	4(0.6%)
VSD PH	large	3(0.4%)

Table (3): Distribution of participating according to presence or congenital malformation or syndromes

	Frequency	**Percentage**
No Syndrome	637	(97%)
Klippel Fiel syndrome	5	(0.07%)
Down syndrome	8	(0.1%)
Anencephaly	2	(0.03%)
Hydrocephaly	2	(0.03%)

Table (4): Relation between children echo cardiac classification and their age, gender, weight, Gestational age & Mode of delivery

		Normal	**CHD**	**Total**	**P value**
Age	<10 Days	402 (62%)	198 (30%)	600	0.001
	11-20 Days	21(3%)	5(0.7%)	27	
	21-30Days	25(3%)	2(0.3%)	28	
Wt . Kg	<2.4Kg	182(27%)	64(9%)	246	**0**.008
	2.5-4 Kg	240(36%)	135(20%)	375	
	>4kg	27(4%)	6(0.9%)	33	
Gender	Male	287(43%)	112(17%)	358	0.070
	Female	201(30%)	93(14%)	294	
Gestational Age	37-40wk.s	302(46%)	98(14,9%)	402	0.083
	33-36wk.s	67(10%)	85(12%)	152	
	<33 wk.s	83(12.9%)	17(2.5%)	100	
Mode of Delivery	Cesarian section	290 (44%)	80(12%)	370	0.125
	Normal vaginal delivery	264(40%)	120(18%)	384	
Murmur	Present	0	18(2.7%)	18	0.09
	Absent	523(79,9%)	113(17%)	636	
Cyanosis	Present	0	13(1.9%)	13	
	Absent	523(79,9%)	118(18%)	641	0.06

The study found there is a statistical significant relationship between children echocardiography & age of newborn where Echocardiography examination done & body weight (p value=0.001, 0.008), but not significant with their gender, gestational age & Mode of delivery, (p value= 0.07 0,0.083,0.125 respectively) this tabulated in table (4).The statistical relationship between presence of CHD and presence of murmur. Cyanosis was also insignificant at (P value 0.06,0.09).

		Total
CHD With Murmur	18(13,7%)	131
CHD without murmur	113(86%)	
CHD with cyanosis	13(9%)	131
CHD without cyanosis	**118(90%)**	

Table (5): Distribution of participant according to presence absence of murmur , cyanosis

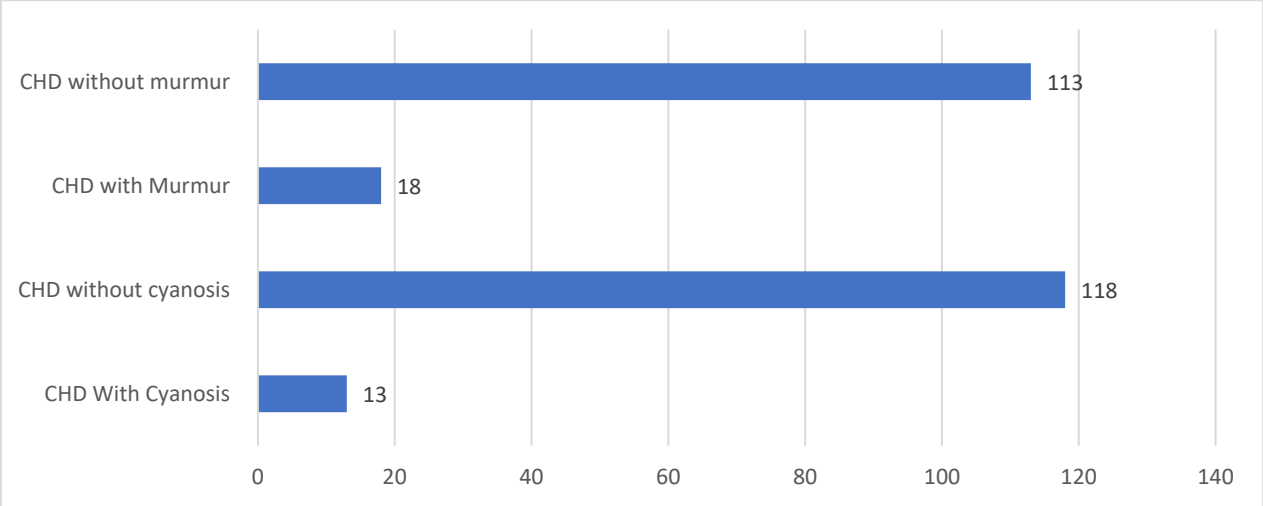


Figure (9): Distribution of participant according to presence absence of murmur, cyanosis.

Discussion:

The results finding the (58%) were male neonate .(42%) were female neonates(92%) of neonates age between 1-10days .(5%) between 10-20days ,3% were between 20-30days .Incidence of CHD were(31%)Incidence of critical cyanotic CHD 7/1000 (D TGA ,DORV ,Truncus arteriosus ,Ebstein malformation of TV).Incidence of a cyanotic CHD almost (30%).The most common type of A cyanotic CHD PFO 12%, PDA 9% without pulmonary hypertension .3% PDA with Pulmonary hypertension ,ASD 3.8% , 89% were full term . 60% were delivered by caesarian section.(2%)were having Down syndrome. Klippel fiel syndrome. Anencephaly , hydrocephaly (27%) of neonate with syndrome having CHD (28%) Of non syndromic neonate have CHD. Most of the participants 423 (76 %) had normal echocardiography examination, 131(20%) participant had CHD, 71(10.8%) were male 63(9.6%) were female Appear figure 1-E. most of them PDA 82(12.5%) Followed by ASD

30(4.5%), VSD (1.5%.) .The critical cyanotic heart disease were 6 cases (0.9%) which include case of DORV VSD Pulmonary valve atresia , D TGA PFO. Truncus arteriosus VSD PH. Ebstein anomaly of tricuspid valve, Complete AV canal PH . As shown in table (2) and figure (2- A& B, & 3).The current study found 60 of the PDA cases were small <1mm , 20 PDA cases were moderate 1-3mm, 12 PDA cases were large >3mm with PH . As appeared in table 2 . 17 ASD cases were small 1-6mm.,13 ASD cases were moderate 6-12mm diameter.10VSD cases were 4 were moderate size

6-8mm, 3 VSD cases were large 10-12mm with PH. The current study showed 637(97%) of the participant are free from associated congenital malformation or syndromes as shown in table 3 .Six hundred fifty four child enrolled in this study, majority of them 615(94%) examined in their age less than 10 days, 26(3 %) aged 11-20 days and only 13(1%) aged 21 -30 days. As shown in table 1 . Regarding the gender most of the children were male 358(55%) remaining female 294(45%) as shown in figure 1 .The Mode of delivery 370(56.6%) delivered by cesarean section, while 284(43.4%) delivered normally, as shown in figure 2.most of children delivered with gestational age of 37-40wk.s 410(62.6%), while the remaining children with gestational age less, this is appeared in figure 3.Incidence of CHD 1st 28days examination was 24%.While after 6months reexamination reduce to 8% because most of The PFO PDA were closed ,As shown in figure 4,5.Most common CHD was PDA (23%) but after 6 months reexamination most common CHD was VSD 14%. Then critical CHD 12% as shown in figure 6,7 .Defect size shown in table 2 . Most of PDA are small size for that most of them close spontaneously. Significant P value regard age group & Body weight .More incidence of CHD in neonate between 1-10 days old. More incidence of CHD in neonate with Normal body weight 2,5-4Kg as shown in table 4 .113 (86%) of participant with CHD have no murmur .,118(90%)have n cyanosis.

Conclusion:

The study concluded that the newborn screening programmer for CHD has been well implemented in our study , and this programmer is a successful public health intervention to reduce infant death and could be successfully implemented in premature unit of maternity hospital settings. Our study provides encouraging evidence and experience for implementing newborn screening programmer.

References:

1. Hssain AM, Hussain AJ, Hmood QK. Pattern of congenital heart disease in newborn in Al-Diwaniyah maternity and children teaching hospital. Al-Qadisiyah Medical Journal. 2013;9(15):202-11.
2. Dorfman AT, Marino BS, Wernovsky G, Tabbutt S, Ravishankar C, Godinez RI, Priestley M, Dodds KM, Rychik J, Gruber PJ, Gaynor JW. Critical heart disease in the neonate: presentation and outcome at a tertiary care center. Pediatric Critical Care Medicine. 2008 Mar 1;9(2):193-202.
3. Kondo M, Ohishi A, Baba T, Fujita T, Iijima S. Can echocardiographic screening in the early days of life detect critical congenital heart disease among apparently healthy newborns?. BMC pediatrics. 2018 Dec;18:1-6.
4. Kurinczuk JJ, Hollowell J, Boyd PA, Oakley L, Brocklehurst P, Gray R. The contribution of congenital anomalies to infant mortality. National Perinatal Epidemiology Unit, University of Oxford. 2010 Jun:2-3.