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# Analysis of congenital cardiac anomalies among neonates in Maternal and Child health hospital of Sakaka Aljouf region (A four year review)

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## Abstract:

***Introduction:*** *In 2008, a study was done by Heron showed that the leading cause of death in infants was the congenital malformations that constitute a huge social and economic burden to the community and the state. In a study that was done in Al-Qassim 316 patients were diagnosed to have congenital heart diseases of 58,908. In the Southwestern region, 608 children patients were referred to Asir central hospital complaining of congenital heart diseases. The children were examined by the pediatric cardiologist using electrocardiogram and echocardiogram. Amongst them, only was only 335 cases. The males were 162 and females were 173 which suffered from CHD.*

***Objective:*** *The goal of this study an analysis of the CHD and other congenital anomalies among newborns in Sakaka in the last 4 years (11/1431 since prior data were not available to end of 1434h).* ***Methodology:*** *Researchers reviewed medical records of Neonatal Intensive care unit (NICU) of Maternity & Children Hospital (MCH) in Sakaka from the year 1431 to 1434. Data regarding congenital heart diseases was obtained by reviewing the information available on the Medical Information System (MIS), records of medical files and the NICU logs.*

***Results:*** *Examining the records of 940 infants from the NICU in the specified period, we found 80 cases with congenital diseases constituting an incidence of 85/1000 live births that are very high compared to international incidences. Among those, 34 cases showed CHD (13 males and 21 were females) constituting an incidence of 36.17/1000 live births that is very high compared to international incidences.*

***Conclusion and Recommendations:*** *This recorded high prevalence of congenital diseases in general and the CHD in particular necessitates urgent investigations towards understanding the cause(s) and employing plans and policies for combating the problem particularly through premarital genetic counseling, food and water, and environment. Patients of this study were usually referred to other specialized centers in the kingdom where they can get proper management due to local staff and equipment deficiencies that put another burden on the community and the kingdom. This caused loss of track of most of cases to follow. Considering the medical information system (MIS), data collection and recoding requires huge reconstruction and techniques for medical records, and data entry, and analysis. These are of utmost importance for setting preventive plans for such diseases.*

## INRODUCTION

In 2008, a study was done by Heron showed that the leading cause of death in infants was the congenital malformations that constitute a huge social and economic burden to the community and the state. [(1)].In a study done by El,Magrpy showed that The most common congenital heart defects were Atrial septal defect,Atrioventricular septal defect and Ventricular septal defect in that order [(2)]. Most of the cases were identified by following the single International pediatric and Congenital cardiac code (IPCCC).In another study done by Houyel L,It had Ventricular septal defect and anomalies of the arterial valves and the great vessels as the most common types of CHD [(3)].The overall mortality was 1.3 and 1.9%, respectively after either operation or

patient discharge. The Mortality was higher in neonates 6.8% and low birth weight infants 12.1%Neonates were likely to develop more serious complications compared to older children [(4)].

In a study that was done in Al-Qassim 316 patients were diagnosed to have congenital heart diseases of 58,908. Ventricular septal defect was the most common 22.5% collectively, 15% of patients were proved to have a syndrome. The most common syndrome was Down syndrome [(5)].

In the Southwestern region, 608 children patients were referred to Asir central hospital complaining of congenital heart diseases. The children were examined by a pediatric cardiologist and had electrocardiogram and echocardiogram. Amongst them, only 335, comprising 162 males and 173 females were proved of having CHD. The male/female ratio was 0.9:1.The most common types of CHD were VSD 32.5%; PDA 15.8%, ASD 10.4%. [(6)].

## Objective:

The go of this study is to analyze the different congenital heart diseases among live births admitted in central hospital of Sakaka, Aljouf, KSA.

## METHOLDOLOGY

Researchers reviewed medical records of Neonatal Intensive care unit (NICU) of Maternity & Children Hospital (MCH) in Sakaka from the year 1431 to 1434. Data regarding congenital heart diseases was obtained by reviewing the information available on the Medical Information System (MIS), records of medical files and the NICU logs.

## RESULTS

Tables 1, 2 and 3 and Figure 1-7 describe the total live birth characteristics and their distribution recorded in the present study during the 3 year. Characteristics and distribution of live births with CHD were further subdivided according to the nature of their congenital defect (Table 1). Table 3 presents the distribution of the live births with other congenital defects in the studied cases within the target period.

**Table 1: Distribution and characteristics of live births recorder during the study period.**

| **Item** / **Period** | **2010-1431** | **2010-1432** | **2011-1433** | **2012-1434** |
|---|---|---|---|---|
| Total No. of births | 3793 | 3862 | 4077 | - |
| No. of newborns in the NICU | 68 | 404 | 378 | 90 |
| Total No. of congenital anomalies | 7 | 33 | 37 | 3 |
| No. of congenital heart defects | 3 | 20 | 10 | 1 |
| No. deaths in the NICU | 3 | 44 | 25 | 1 |
| No. of deaths caused by congenital anomalies in newborns | 1 | 11 | 8 | 0 |

**Table 2: Distribution and characteristics of live births with CHD recorded during the study period.**

| Type of the Defect | No. of Cases |
|---|---|
| Total No.CHD cases | 34 |
| No. male cases with CHD | 13 (38%) |
| No. of female cases with CHD | 21 (62%) |
| No. of non-specific CHD cases | 21 (62%) |
| No. of CHD cases with Tetralogy of Fallout (TOF) | 4 (11%) |
| No. of CHD cases with Patent Ductus Arteriosus (PDA) | 2 (6%) |
| No. of CHD cases with Transposition of Great Arteries (TGA) | 5 (14%) |
| No. of CHD cases with Dextrocardia | 1 (3%) |
| No. of CHD cases with Truncus arteriosus | 1 (3%) |
| No. of CHD cases with deaths caused by CHD | 7 |

**Table 3: Distribution and characteristics of live births with other congenital anomalies recorder during the study period.**

| Type of the Congenital Anomaly | No. of Cases |
|---|---|
| Non-Specific | 8 |
| Osteogenesis Imperfecta (OI) | 1 |
| Tethered Spinal Cord Syndrome (TSCS) | 1 |
| Congenital Pneumonia | 11 |
| Multiple Congenital Anomalies | 3 |
| Potter Syndrome | 2 |
| Prune – Billy Syndrome | 1 |
| Arthrogryposis multiplex congenita (AMC) | 1 |
| Down Syndrome | 6 |

| | |
|---|---|
| Atresia | 1 |
| Congenital Diaphragmatic Hernia | 5 |
| Cleft Palate | 2 |
| Polycystic kidney disease | 1 |
| Bilateral choanal atresia | 1 |
| Tracheoesophageal fistula (TEF) | 2 |
| Meningocele | 3 |
| Spinal Bifida | 1 |

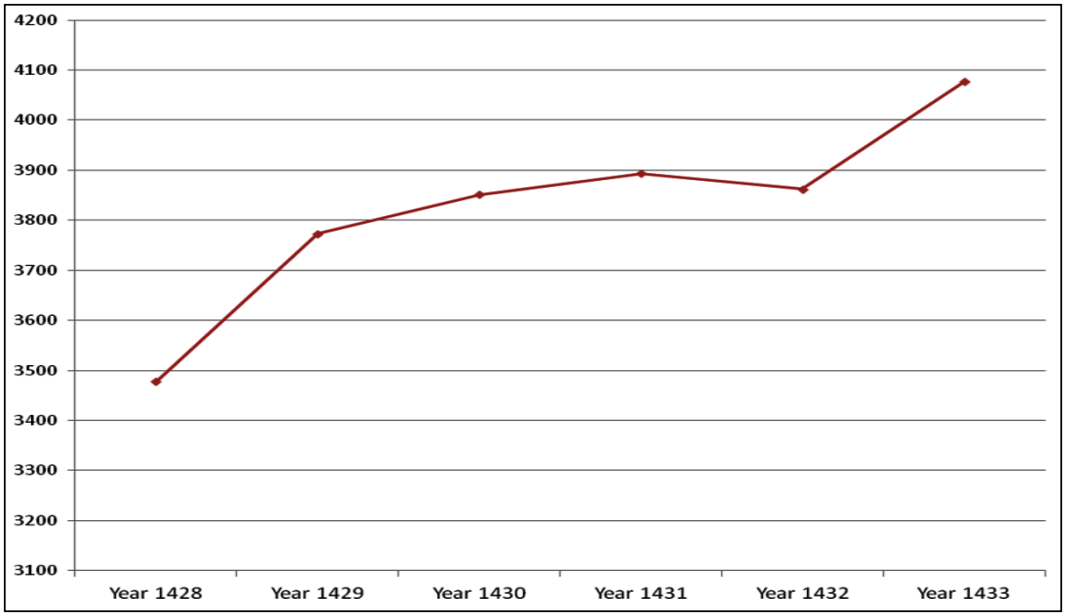


**Figure 1: Number of live births in the past 5 years.**

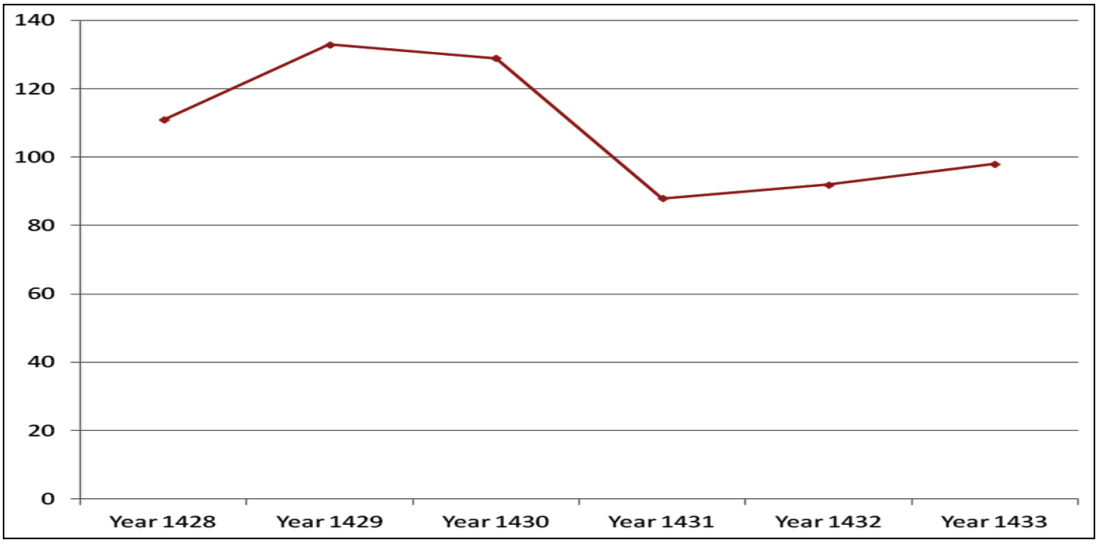


**Figure 2: Number of deaths in the past 5 years.**

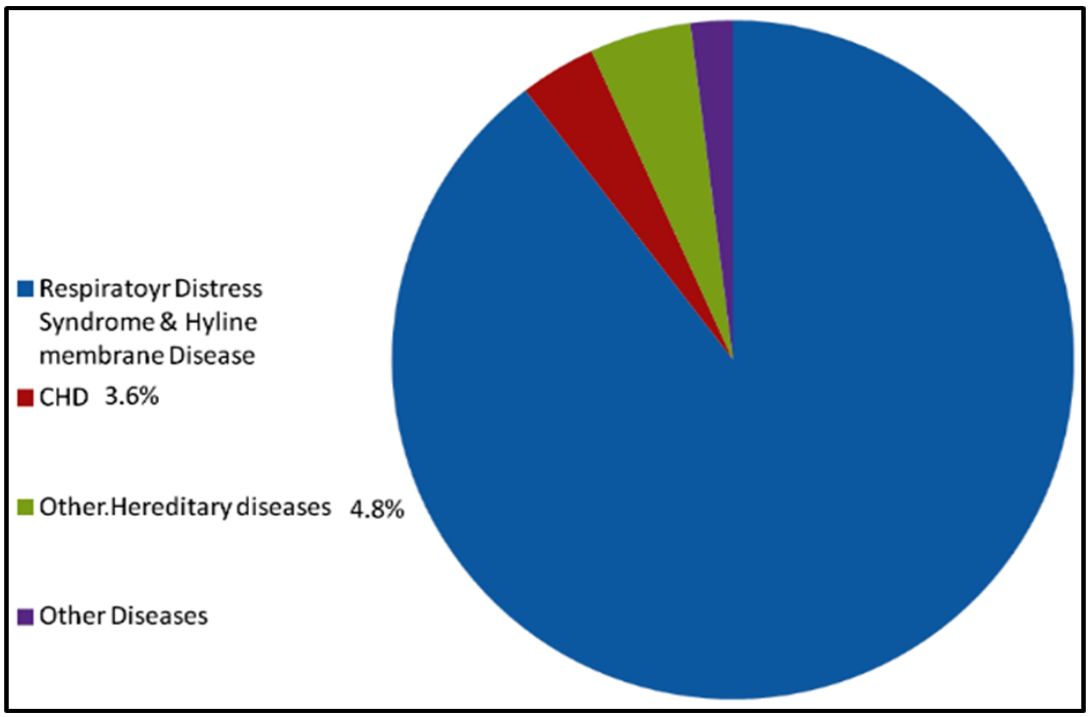


**Figure 3: Distribution of the different types of diseases in the NICU.**

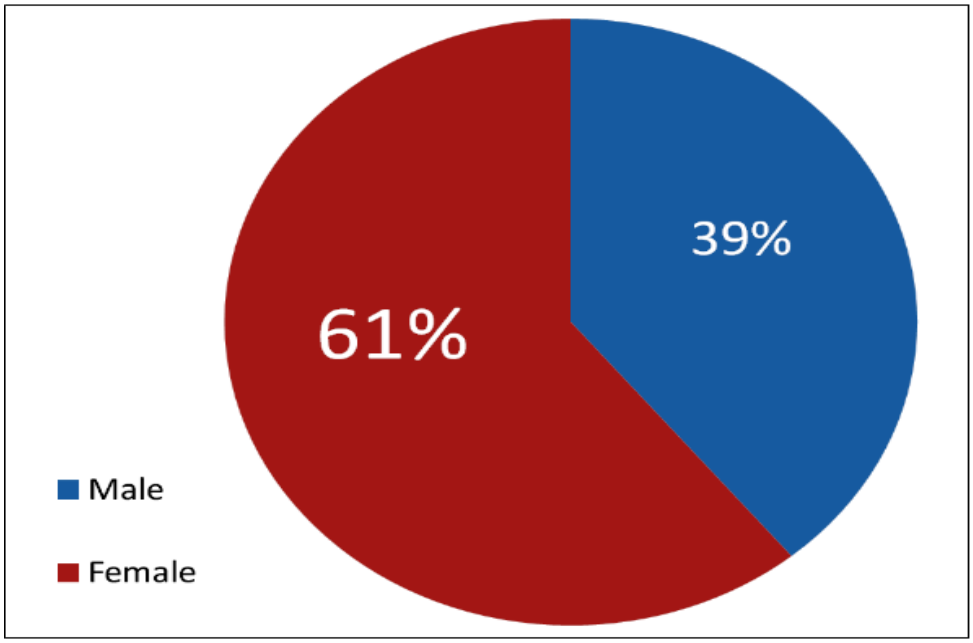


**Figure4: Gender distribution of CHD cases.**

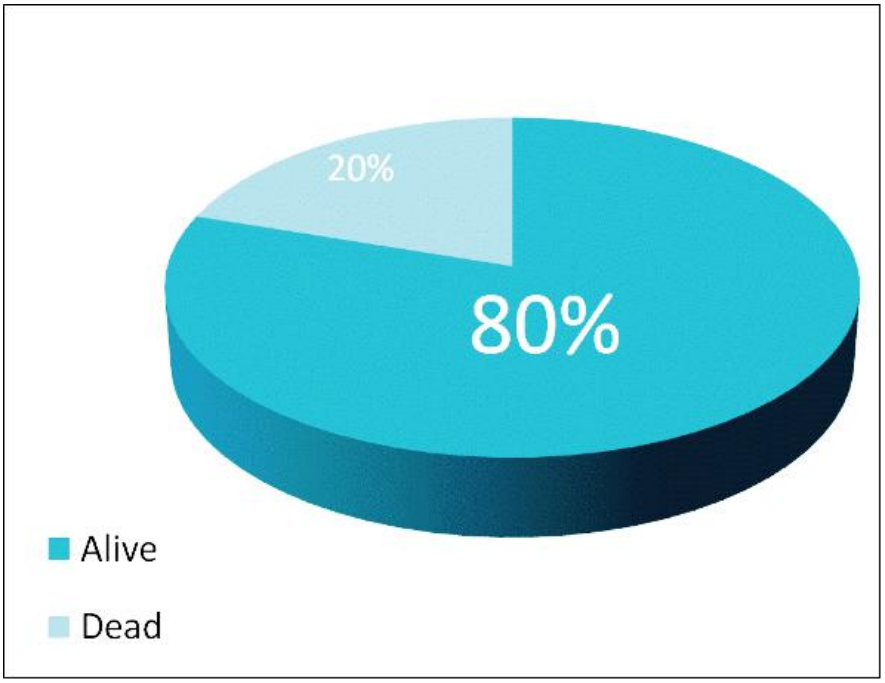


**Figure 5: Percentage of alive & dead infant who suffered from CHD.**

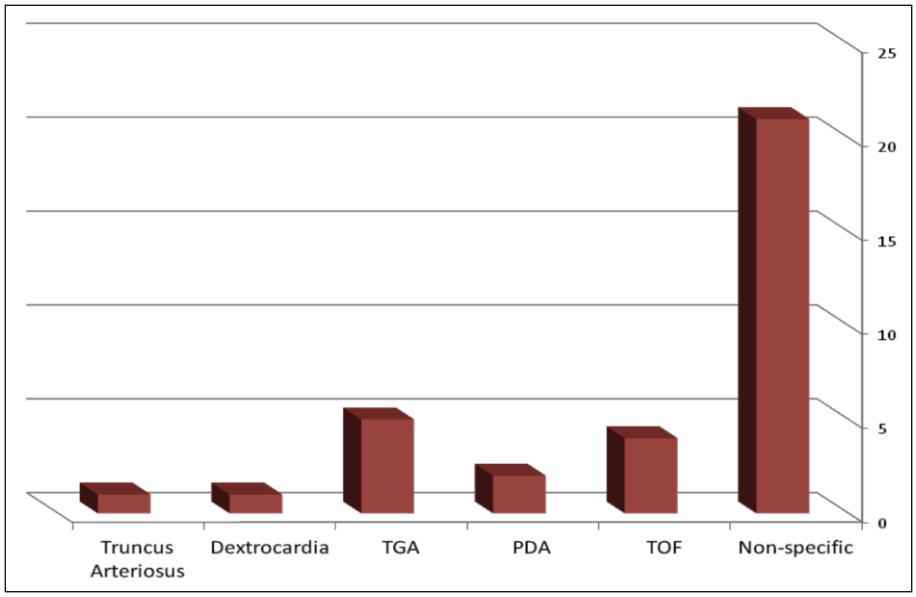


**Figure 6: The number and type of CHD that were diagnosed.**

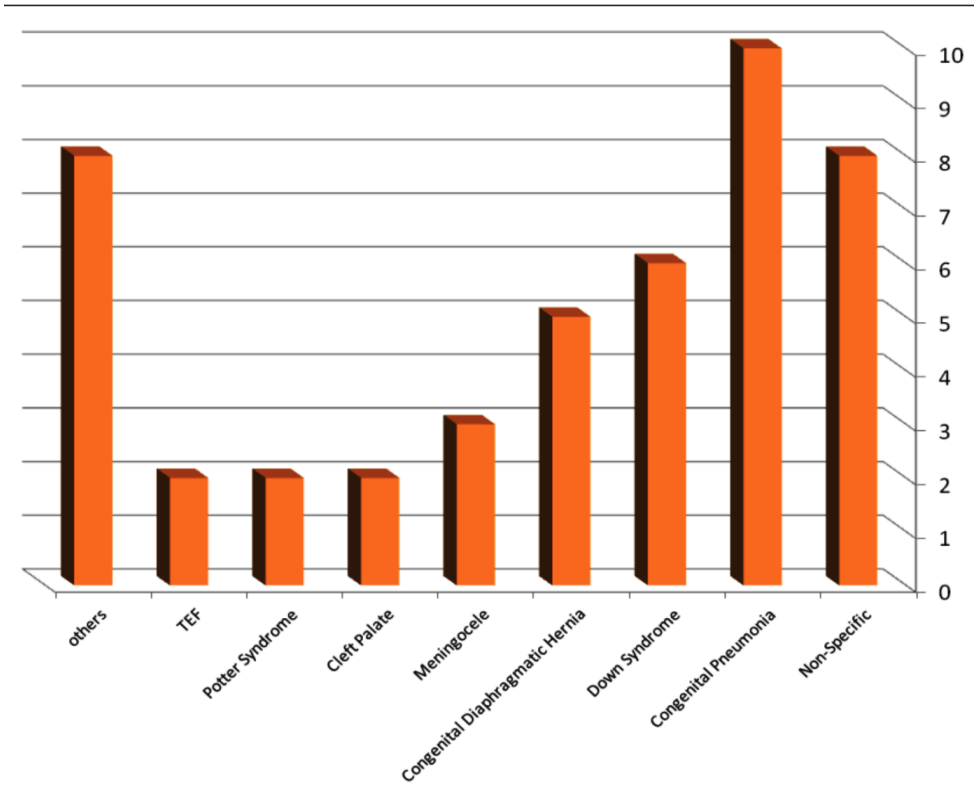


**Figure 7: The distribution of the diagnosed congenital diseases other than CHD.**

## DISCUSSION

The results show that there is 1 death per 5 infants who had CHD, out of 34 cases we registered. They are referred to other hospitals for further evaluation and management. Abbag described in his paper that the male/female ratio was 0.9:1 (7), which is different from what we found in Sakaka 1:2. We picked the NICU logs because these logs contain most accurate diagnosis as compared to the other departments of the MCH and since the congenital anomalies are detected at birth so we decided to take the NICU logs.

The interesting thing about the congenital anomalies was that the cases were registered in a certain sequence for, e.g., there were 3 cases of Congenital Diaphragmatic hernia .that were one after another. Only one of the CHD was associated with Down Syndrome. There was one case which had 2 syndromes and 1 congenital disease which were (Prune-Billy Syndrome/Potter Syndrome & Congenital Pneumonia) and the outcome was fatal. Al-Mesned et al., has mentioned in their paper that the most common CHD's are the Ventricular septal defect and atrial septal defect [(7)]. But we didn't find any cases of VSD & ASD while we were collecting our data. These cases were registered as Non-specific CHD. We also have a deficiency of pediatric cardiologists in MCH as there is an average of 10 births per day which makes it harder to detect VSD/ASD.

It is important to note that not all of the hereditary disorders were exactly collected. For example: Chromosomal disorders are not registered in the MCH hospital Records, since the blood sample are sent to King Faisal Hospital in Riyadh and that needs further research. We only were able to get the ones who were admitted to NICU.

## CONCLUSION

We have lost to follow up of the cases because of the absence of pediatrics cardiologist and proper medical equipment for diagnosis. The patients were referred to other hospital in the Kingdom where they can get proper treatment and follow up. If we have a better equipped hospital in Sakaka in terms of personnel and equipments, we can have a proper management and follow up. Regarding the MIS, we have to improve the data collecting techniques, e.g., medical records, data entry and analysis.

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