were found to be abnormal (3 x 22q11 and 1 x trisomy 21) which led to 1 termination of pregnancy (1 x 22q11). There were also 2 intra-uterine deaths (1 x 22q11 and 1 unexplained). Of 61 babies born alive, 6 became symptomatic and 5 of these required further investigations. Eventually 2 of these children required vascular ring surgery. Furthermore, 16 vascular ring surgeries were performed for symptomatic isolated RAA between Jan 2010 – Jan 2020. 8 were born after introduction of 3VT imaging (i.e. Jan 2015 – August 2020). 4 out of 8 were antenatally diagnosed with RAA (this includes the 2 other antenatally diagnosed RAA diagnosed at the sister fetal cardiac unit).

Conclusions Antenatal diagnosis provided an ideal opportunity to discover associated genetic abnormalities which allowed for parental counselling and planning for optimal postnatal care. Furthermore, although a small number of patients did eventually become symptomatic and require investigating – there was no increase in vascular ring operations performed for isolated RAA despite the introduction of 3VT imaging. We therefore recommend that children with antenatal diagnosis of isolated RAA are managed conservatively with routine follow up, appropriate safety netting advice and further investigations only if they become symptomatic.

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IMPLEMENTATION OF PULSE OXIMETRY SCREENING PROGRAM FOR CRITICAL CONGENITAL HEART DEFECTS

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Background

- Congenital Heart Disease (CHD) affects 8 in 1,000 newborns. Critical Congenital Heart Defects (CCHD) occur in 1 to 3 per 1,000 live births and account for about 40% of deaths from other congenital malformations in the first year of life.
- CCHD outcomes are improved when newborn babies are detected before the acute cardiovascular collapse. Despite antenatal ultrasonography and postnatal clinical examination, there is still a significant proportion of babies with CCHD missed.
- Routine Pulse Oximetry Screening using Special Algorithm has been reported as an additional screening test that can improve detection of CCHD.

Objectives

- Evaluate the implementation results of Pulse Oximetry Screening in the Well Baby Nursery (WBN) at King Fahd Armed Forces Hospital (KFAFH) for CCHD detection.
- Measure missed newborns with undiagnosed CCHD discharged from KFAFH WBN.
- Evaluate the incidence of CCHD in the KFAFH newborn population.

Methods

- This is a prospective study carried out over 3 years (January 2016 till December 2018).
- Pulse-Oximetry Screening included all healthy newborns at 24 hours of age or just before discharge.
- All echocardiography's done for readmitted newborns within the 1st two weeks after discharge were reviewed to detect missed CCHD cases, as KFAFH is considered a tertiary hospital with a cardiac center.
- All CHD were collected. CCHD cases were identified whether the diagnosis was antenatally detected, symptomatic before 24 hours of age, or detected by the CCHD Pulse Oximetry Screening.

Results

- 17130 newborns were eligible for screening representing 100% of admissions at KFAFH WBN with a mean number of 475.8 newborns screened per month.
- 153 CHD detected with a Mean Incidence of 8.93/1000 live birth.
- 34 cases had CCHD with a Mean Incidence of 1.98/1000 live birth and represent 22.22% of all CHD.
- These 34 cases including:
 - 15 HLHS.
 - 7 TGA.
 - 4 Fallot Tetralogy.
 - 3 Pulmonary Atresia.
 - 3 Severe Coarctation Of the Aorta.
 - 1 Ebstein anomaly.
 - 1 Truncus Arteriosus
- Of these 35 cases
 - 17 cases (50%) were diagnosed **Antenatally**.
 - 13 cases (38.2%) were **Symptomatic**.
 - 5 cases (11.8%) were diagnosed with **Pulse Oximetry Screening**.
- 4 CCHD cases diagnosed with echocardiography after Positive Pulsoximetry Screening Result including:
 - 2 Hypoplastic Left Heart Syndrome (HLHS).
 - 1 Ebstein Anomaly.
 - 1 Severe Pulmonary Stenosis.
- All echocardiography's done for readmitted newborns within the 1st two weeks after discharge were reviewed and showed NO MISSED UNDIAGNOSED CCHD cases before hospital discharge.

Conclusions

- CCHD Pulse Oximetry Screening Program should be part of the standard of care to all newborns, as it has an important role in the detection of silent cases with CCHD that are not diagnosed either antenatally or with postnatal clinical examination.
- Our incidence at KFAFH hospital newborns for CHD and CCHD is slightly higher than the international incidence, thus combining an effective CCHD antenatal screening with postnatal Pulse Oximetry Screening will have a significant effect on reducing the significant morbidity and mortality associated with CCHD.