REVIEW OF LITERATURE:

Doff B. McElhinney et al., 18 2003 states that Twelve distinct mutations in the NKX2-5 coding region were identified in 18 of 608 patients (3%), including 9 of 201 (4%) with tetralogy of Fallot, 3 of 71 (4%) with a secundum ASD, one each with truncus arteriosus, double-outlet right ventricle, L-transposition of the great arteries, interrupted aortic arch, hypoplastic left heart syndrome, and aortic coarctation, but in no patients with D-transposition of the great arteries (n _ 86) or valvar aortic stenosis (n_ 21). Eleven of the mutations were amino acid-altering missense nucleotide substitutions or deletions, and one was predicted to cause premature termination of translation.

Kathy J. Jenkins et al., 41 2007 states that periconceptional multivitamin or folic acid intake, which may reduce the risk of cardiac disease in the fetus, and for additional types of potential exposures that may increase the risk, including maternal illnesses, maternal therapeutic and nontherapeutic drug exposures, environmental exposures, and paternal exposures. Information is highlighted regarding definitive risk factors such as maternal rubella; phenylketonuria; pregestational diabetes; exposure to thalidomide, vitamin A cogeners, or retinoids; and indomethacin tolcolysis.

Kapoor R, et al., 14 2008 states that to study the prevalence, age-wise distribution, and clinical spectrum of congenital heart disease (CHD) at a multi-specialty corporate hospital in North India, kanpur. A retrospective analysis of records of 10,641 patients over a five-and-a-half years. Clinical examination, echocardiography and color Doppler were used as diagnostic tools. A prevalence of 26.4 per 1000 patients was observed. VSD (ventricular septal defect) was the commonest lesion (21.3%), followed by ASD (atrial septal defect) in 18.9% and PDA (patent ductus arteriosus) in 14.6%. Tetralogy of Fallot was the commonest cyanotic heart disease (4.6%). Maximum number of children with heart disease (82.9%) was diagnosed between 0-3 years of age.

J M Draus Jr, et al., 15 2008 states that total of 28 patients were selected for CHD studies. They included: atrial septal defects (ASD=13, among that 11 isolated secundum ASD, one sinus venosus ASD with partial anomalous pulmonary venous return, one secundum ASD with total anomalous pulmonary venous return); ventricular septal defects (VSD=5: two isolated perimembranous VSD, one perimembranous VSD with right aortic arch and aberrant left subclavian artery, one perimembranous VSD with D-transposition of the great vessels, pulmonary atresia and hypoplastic
left ventricle, one malalignment VSD with tetralogy of Fallot); and AV canal defects (AVCD=10: eight with complete AV canal defects (CAVC), and two with transitional AV canal defects (TAVC).

**Vilas Boas et al.,** 10 **2009**, study a relevant fact is that most patients had echocardiograms (93.6%), which suggests that an adequate and early cardiac evaluation was performed; age at diagnosis, for most patients, was lower than 12 months of age (85.1%).

**Smitha Rame Gowda et al.,** 12 **2010** states that the causes for CHD can be categorized into three major groups such as, chromosomal (0.4 - 26.8%), single gene disorders (10-15%) and multiple factors (85-90%). They report the association of chromosomal variations with CHD in Mysore 12. A total of 192 confirmed CHD cases were considered for the study whose age ranged from 1 day to 23 years. After written consent was obtained from the family members, 136 CHD patients were subjected for conventional cytogenetic studies and some of them for FISH analysis. Of these, 18 patients were with numerical abnormalities, 3 patients with structural abnormalities, one patient with both numerical and structural abnormalities and remaining 114 patients with normal chromosomes 12. The present findings are the maiden report from Mysore, which have contributed richly towards the association of chromosomal anomalies with CHD and pointing out chromosome 9 a possible killer chromosome for the cause of CHD.

**Denise van der Linde et al.,** 40 **2011**, states that total CHD birth prevalence increased substantially over the last century, reaching a stable estimate of 9 per 1,000 live births in the last 15 years 40. This corresponds to 1.35 million newborns with CHD every year, representing a major global health problem. Significant geographical differences were found. It remains uncertain whether detected differences in CHD birth prevalence represent true or merely methodological differences. In the future, the etiology of CHD needs to be further clarified and population wide prospective birth defect registries covering the entire world population are needed to determine the exact birth prevalence.

**Ritu Bhardwaj et al.,** 4 **2014** states that the incidence of CHD varies with the age group studied. Although the majority of CHDs were diagnosed within the first few weeks of life, nearly one-third of CHDs were detected after the first birthday. This study not only covered the pediatric population but also adults (>18 years) with congenital heart defects, the latter category consisting of 83 out of 661 patients (12% of the cases), with a prevalence of 2.4/1000 adult CHDs in the population 4. In addition to this, in 6% of cases, ASD and VSD were present simultaneously, and in 6% of cases,
VSD was present in combination with a variety of other cardiac defects (PS, PDA, PFO, and BAV), showing a very high occurrence rate of this lesion. Out of 220 VSD cases, 64% were detected in patients in the 0–5-year age group, 17% in patients of 6–10 years, 12% in patients 11–17 years, and 5% in adults. Advanced maternal age and multiple pregnancies are believed to be associated with perimembranous and muscular VSD; however, such a correlation could not be identified in the present cohort. ASD was the second most frequent CHD (19%), followed by TOF (16%). The ostium secundum type of ASD was the most predominant one.

Ambreen Asim et al., 2016 states that ASD was found to be most common form of CHD with the frequency of 33.3%, 51.8% and 23% respectively. The second most common type of CHD in these studies’ was AVSD with the frequency of 27.7%, 46.4% and 19% respectively.

IM Chung and Govindasamy Rajakumar., 2016, states that cardio genesis is a complicated process, comprising of numerous intricate pathways, where NKX2-5 plays a pivotal role. Aberrations in the NKX2-5 transcription factor have been reported in various types of congenital heart defects and are spread across various domains on the gene. Functional studies have shed light on the mechanism of action of these mutations but more analysis will be needed to understand the entire picture of cardiac malformation.

Anant C Fulse et al., 2017 states that Down’s syndrome is also one of the genetic causes of CHD in the pediatric cases. Down’s syndrome can be prevalent in the children with CHD, whereas, the prevalence of Down’s syndrome was significantly very low when evaluated to age-matched control participants. The incidence of Down’s syndrome among children with CHD was found to be 1.87%.

Rajkumar Motiram Meshram et al., 2018 states that Among a total of 42,423 patients availing outpatient and inpatient facilities at the pediatric department of a tertiary referral center, 655 were clinically suspected as having heart disease among which 430 patients were identified as CHD, giving a prevalence of 10.13/1000 live births. About 56.28% patients are below 1 year and male: female ratio was 1.3:1. Consanguinity was observed in 42.09% and most of them were of third degree. Breathlessness was the most common symptom and tachycardia was the most common sign. About 66.74% of patients were diagnosed with acyanotic and 33.26% with cyanotic type. The most common CHD was ventricular septal defect (VSD) (30.01%) followed by atrial septal defect (20.70%), tetralogy of fallot (TOF) (16.05%), and patent ductus arteriosus (10.23%)