PREVALENCE OF FETAL CONGENITAL HEART ANOMALIES IN FETUSES WITH OTHER STRUCTURAL ANOMALIES

Thesis

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بسم الله الرحمن الرحيم

"ويسئلونك عن الروح قل الروح من أمر ربي
وما أوتيتم من العلم إلا قليلا"

صدق الله العظيم
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Abstract

Congenital heart diseases (CHD) are the most common fetal malformations with incidence of four to eight cases per I ,000 live births being responsible for 20% of neonatal mortality and 50% of the deaths in infants. Still most diagnoses are performed postnatal.

100 women pregnant in fetuses with confirmed structural congenital anomaly who came to Obstetrics and Gynecology outpatient clinic and referred to Fetal Medicine Unit were included in our study, we detected that CNS anomalies were the most prevalent defects followed by Cardiac, Hydrops, Renal, Skeletal, Chest & GIT anomalies. The risk of extracardiac malformations is 33.3%. The Prevalence of fetal congenital heart anomalies in fetuses with other structural anomalies is 11%.

Keywords:

CHD
Prevalence
Anomalies
Extracardiac

INTRODUCTION

INTRODUCTION

Congenital abnormalities are the main cause of infant death in industrialized countries **[Petrini et al., 2002, Lee et al., 2001]**.

Congenital abnormalities are frequently diagnosed before birth as many of the major fetal abnormalities can be detected by a prenatal ultrasound examination **[Levi et al., 2002]**.

Congenital heart diseases (CHD) are the most common fetal malformations with incidence of four to eight cases per 1,000 live births being responsible for 20% of neonatal mortality and 50% of the deaths in infants **[Bahtiyar et al., 2007]**. Still most diagnoses are performed postnatal **[Game et al., 2001]**.

The Eurocat study has shown that the overall detection of CHD is 25% with a range of 19-48% in Western European countries **[Game et al., 2001]**. A more recent population-based study was performed in Australia by Chew et al. **[Chew et al., 2007]** and showed an overall antenatal detection rate of 53% for CHD in 631 209 patients.

Nowadays echocardiography represents not only the gold standard for prenatal diagnosis of CHI but also the unique standardized imaging modality for the evaluation of cardiac structures **[Carvalho et al., 2005]**.

Thus timing of a first or subsequent fetal echocardiogram needs to be a balance between the feasibility of seeing an abnormality and the accuracy of such a finding. The current consensus is a single preliminary examination at 20 weeks of gestation in the low-risk population (by an obstetric scanner) or preliminary examination at 12 to 14 weeks followed by another examination at 20 weeks in a high-risk population (by a fetal cardiology expert) **[Gabriel et al., 2002, Allan et al., 2003, Haak et al., 2003]**.

Multiple studies have documented the benefits to the newborn of a fetal CHD diagnosis including prompt delivery of medical care and avoidance of severe cyanosis or low cardiac output by maintenance of ductus arteriosus patency **[Mahle et al., 2001,Tworetzky et al., 200l]**.

Congenital heart disease is commonly associated with other extracardiac malformations **[Antolin et al., 2001]**.

Extracardiac anomalies as Omphalocele, Duodenal atresia, Spina bifada, VACTERL are commonly associated with cardiac anomalies **[Shipp et al., 1995]**.

Of 1,763,591 persons born in Denmark in the period l977 to 2005, 18,207 had CHDs yielding an overall CHD prevalence of 103 per 10,000 live births Additional extracardiac birth defects were found in 4,067 (22.3%) persons with CHD **[Nina Oyen et al., 2009]**.

AIM OF THE WORK

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The aim of this cross sectional study is to detect the prevalence of fetal congenital heart anomalies in fetuses with other structural anomalies.

REVIEW OF LITERATURE

Chapter 1

INTRODUCTION TO HUMAN HEART EMBRYOLOGY AND DEVELOPMENT

The primary heart field, secondary heart field, cardiac neural crest and proepicardium are the four major embryonic regions involved in the process of vertebrate heart development. They each make an important contribution to overall cardiac development which occurs with complex developmental timing and regulation. The heart is the first organ to fully form and function during vertebrate development and many of the underlying mechanisms are considered molecularly and developmentally conserved **[Srivastava and Olson, 2000]**.

Primary Heart Field and Linear Heart Tube Formation:

The cells that will become the heart are among the first cell lineages formed in the vertebrate embryo **[Yutzey et al., 2002]**.

By day 15 of human development the primitive streak has formed **[Sherman et al., 2001]** and the first mesodermal cells to migrate (gastrulate) through the primitive streak are cells fated to become the heart **[Psychoyos et al., 1996]**.

These mesodermal cells migrate to an anterior and lateral position where they form bilateral primary heart fields **[Ehrman and Yutzey, 1999]**.

At day 18 of human development the lateral plate mesoderm is split into two layers: somatopleuric and splanchnopleuric **[Sherman et al., 2001]**.

It is the splanchnopleuric mesoderm layer that contains the myocardial and endocardial cardiogenic precursors in the region of the primary heart fields as defined above. Presumptive endocardial cells