IRB Protocol Proposal

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Project Title: Timing of Delivery and Mortality Risk in the Fetus with Congenital Heart Disease and Small for Gestational Age

A. Study Purpose and Rationale

Congenital heart disease (CHD) and small for gestational age (SGA) both represent significant fetal risk factors, associated with increased morbidity and mortality in the perinatal period[1,6]. In CHD, it has been shown that this risk is closely tied with gestational age, and can be attenuated with deferred delivery ideally past 39 weeks of gestation[2,3]. SGA, particularly in cases with intrauterine growth restriction (IUGR), carry a significant risk of fetal demise due to presumed placental insufficiency[4]. This has led many practitioners to opt for earlier delivery, traditionally by induction at term, or 37 weeks gestation, although more recent data has suggested expectant delivery until 39 weeks carries similar risk[5,7].

Interestingly, the fetus with CHD is at increased risk for also being born SGA. Even when correcting for chromosomal anomalies or extracardiac malformations, CHD can have 3 fold increased risk of developing IUGR later in the pregnancy, and to be SGA at birth[7,8]. To date no studies have examined a potential relationship between gestational age at birth with mortality in children born with CHD and are SGA. Such a study may inform decision making regarding an optimal delivery date in the fetus with suspected CHD and SGA.

B. Study Design and Statistical Analysis

We will perform a retrospective review using publicly available datasets from the National Center for Health Statistics. We will query linked birth and death records for subjects from 2007-2015 with a known gestational age, birth weight, gender and death certificate with a cause of death coded via the International Statistical Classification of Diseases, 10th Revision. Cases will be selected based off a cause of death associated with congenital malformations of the cardiovascular system. Using gestational age, gender and birth weight, the birth percentile for each subject will be calculated and cases with a percentile 10% or greater will be excluded. Death rates will be calculated for each gestational age as number of cardiovascular disease deaths over number of live births. These death rates will then be compared to gestational age using regression analysis.

C. Study Procedure

No procedures are being performed as a part of this study

D. Study Drugs

No drugs or medications are being administered as part of this study

E. Medical Device

No medical devices are being used as part of this study

F. Study Questionnaires

No questionnaires are being used as part of this study

G. Study Subjects

Study subjects are infants aged 0-365 days as part of the linked infant birth-death cohort from the National Center for Health Statistics from years 2007-2015. Inclusion criteria are: infants with known gestational age by LMP or OE, birth weight, gender, race and cause of death with associated ICD-10 code matching congenital malformation of the cardiovascular system. Exclusion criteria are incomplete data, or difference in gestational estimate between LMP and OE >3 weeks.

H. Recruitment of Subjects

There will be no recruitment of subjects for this study

I. Confidentiality of Study Data

Information used in this study will be obtained from publicly available datasets and is completely deidentified as per National Center for Health Statistics guidelines. All information will be kept on a secure server that is encrypted and password protected.

J. Potential Conflict of Interest

There are no potential conflicts of interest with any member of the study team

K. Location of the Study

Data will be obtained online via the National Center for Health Statistics website. Data analysis will take place on the Morgan Stanley Children's Hospital campus.

L. Potential Risks

Given that this is a retrospective review of publicly available data, this study has minimal risk and therefore should be subject to expedited review

M. Potential Benefits

There are no potential benefits to subject participants, however information obtained from this study could inform medical decision making in the future.

N. Alternative Therapies

There are no alternative therapies to this study because there are no interventions being studied

O. Compensation of Subjects

Subjects of this study will not be compensated in any way

P. Costs to Subject

There will be no costs to subjects participating in this study

Q. Minors as Research Subjects

All subjects studied in this study are minors, however as it is a retrospective review of publicly available data this study poses minimal risk to these subjects.

R. Radiation of Radioactive Substances

There will be no radiation or radioactive substances used as part of this study

S. References

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