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MANAGEMENT AND PREVENTION OF STILLBIRTH

BACKGROUND

-incidence approximately 1 in 150 pregnancies

-recurrence approximately 3% (depends on underlying cause)

-parents often have these 3 questions:

-Why did this happen?

-Could it happen again?

-What do we do now?

ETIOLOGY

Most frequent causes:

-fetal growth restriction

-post dates (poorly dated pregnancy)

-fetal aneuploidy (abnormal number of chromosomes)

(Down syndrome and Turner Syndrome = most common)

-lethal fetal anomalies/syndromes

-hypertensive disease (principally due to unexpected abruption)

-poorly controlled diabetes

-extreme obesity, especially close to term (pathophysiology unclear)

-thyroid disease (both hyper- and hypo-)

-intrahepatic cholestasis of pregnancy

-lupus erythematosus

(especially with antiphospholipid syndrome or renal insufficiency)

-fetal infections

(cytomegalovirus, parvovirus, syphilis, etc.)

-feto-maternal hemorrhage (especially after trauma)

-nevertheless, up to a third of stillbirths are idiopathic, despite work up

-cord accidents are actually an uncommon, but commonly ascribed, cause of stillbirths (excluding overt cord prolapse, velamentous insertion, entanglement of monoamnionic twins)

-likewise, the inherited thrombophilias are no longer thought to be a significant cause of stillbirth

IUFD WORK-UP

A thorough work up can provide answers to the family and give insight to future clinical care.

Fetal gross exam findings:

The following gross findings appear to be good predictors of the time of fetal death:

- Brown or red discoloration of the umbilical cord or desquamation ≥1 cm suggests the fetus has been dead at least six hours before delivery.
- Desquamation of the face, back, abdomen suggests the fetus has been dead at least 12 hours before delivery.
- Desquamation ≥5 percent of the body or ≥2 body zones suggests the fetus has been dead at least 18 hours before delivery (body zones = scalp, face, neck, chest, back, arms, hand, leg, foot, scrotum).
- Skin color that is brown or tan suggests the fetus has been dead at least 24 hours before delivery.
- Mummification (ie, reduced soft tissue volume, leathery skin, deeply grey-brown-stained tissues) suggests the fetus has been dead at least two weeks before delivery.
- The fetus can be sent to Pathology for a 'gross only' exam

Laboratory:

-Amniocentesis for fetal karyotyping has the highest yield and is particularly valuable if delivery is not expected imminently. Fluorescence in situ hybridization may be useful if

fetal cells cannot be cultured. Likewise, comparative microarray analysis (CMA), is able to detect significantly more fetal aneuploidy and other chromosomal abnormalities compared to traditional karyotyping (where the failure rate is up to 30% due to tissue autolysis in the setting of IUFD).

Maternal Orders: Prior to delivery

Alanine aminotransferase (ALT) aka SGPT

Alkaline phosphatase

Anticardiolipin antibody*

Aspartate aminotransferase (AST) aka SGOT

Beta-2-glycoprotein-1 antibody*

Bile acids

Bilirubin, total

Complete blood count with differential, and platelet count

Creatinine

Drug screen (urine)

Fibrinogen

Glucose

Group B Beta Strep culture (rectovaginal)

Herpes simplex virus culture (cervical)

Keilhauer Betke

Lupus anticoagulant*

Parvovirus IgG and IgM

Prothrombin time, partial thromboplastin time

Rapid plasma reagin

TSH

Type and screen

Urinalysis, clean catch

* If testing for APAS is positive by any of these three tests, please repeat testing in 12 weeks to confirm.

Secondary Laboratory Testing

If signs of severe IUGR, severe preeclampsia, placental findings of vasculopathy, then consider testing for inherited thrombophilia:

Before delivery:

-Factor V Leiden

12 weeks after deliver

-Protein S

-Protein C

Autopsy

The frequency of unexplained stillbirth at term is less than 30 to 40 percent of cases receiving optimal evaluation. Findings at perinatal autopsy can change the clinical diagnosis of the cause of fetal death or yield additional findings. This new information often influences management of future pregnancies. The likelihood of finding an explanatory diagnosis depends on the completeness of the examination, the experience of the pathologist, and the gestational age at delivery.

New information from autopsy can change the estimated recurrence risk in 40 percent of cases, and changed recommendations for preconception care in 9 percent, prenatal diagnostic procedures in 21 percent, prenatal management in 7 percent, and neonatal management in 3 percent.

Multiple levels of autopsy can be ordered:

-Imaging only (X-ray /CT / MRI)

-Head sparing

-Full autopsy

IUFD DELIVERY

-diagnosis confirmed with bedside ultrasound

-parents to decide on timing of induction

(risk of coagulopathy minimal unless stillbirth >3 weeks)

-dose of misoprostol may be 200-400 mcg vaginally q4-6h in the second trimester

-30 cc Foley bulb ripening followed by oxytocin is safe in women at term with prior cesarean

-misoprostol (400 mcg) safe for women in the 2nd trimester (<28 wks) with prior Cesarean

-at term use misoprostol as per usual dosing

-Send placenta

-Complete gross description of fetus including weight

-Amniotic fluid should be at least 15 mL for early gestation, and at least 20 mL for more advanced gestation

-To maximize the yield on the chromosome studies: the most viable tissue generally is the placenta or segment of umbilical cord closest to the placenta, followed by fetal skin from the thigh, or cartilage obtained from the costochondral junction or patella. Tissue sample should be 1 cm square of placental tissue at the cord insertion and a 1 cm segment of cord placed in the pink transport media

Orders at delivery:

Fetal autopsy (with permit)

Fetal cultures (stomach or oral)

Fetal karyotype (see sampling method above)

Fetal photographs (for patient record)

Fetal X-ray, total body

Placenta for histology /pathology (after karyotype obtained)

AFTERCARE

-encouraging parents to see and hold the infant helps with the grieving process

(See Appendix 1: The Five Protections)

-photos or mementos may be appropriate if parents desire

-chaplaincy services appropriate if parents desire

-social service consult appropriate to help parents make funeral arrangements

-approach parents about autopsy (provides the most useful information about etiology)

-advise about managing engorged breasts

- if mother is from the Anchorage bowl area, contact the OB/GYN SCF Behavioral Health Specialist for outpatient follow-up in one week

-arrange follow up with provider in 6 weeks to review lab work up and autopsy reports

-advise about future pregnancies as able, depending on etiology (if able to be determined)

-discuss contraception; usually best to avoid immediate sterilization, even if planned

-avoid “sedative” medication, offering counseling more appropriate

-All patients should be scheduled for follow-up. The visit should ensure coping / mood are stable, review of available testing, review of health / interpregnancy optimization

-If the patient is from a remote site, then the attending provider may follow-up by phone

<u>Recurrence Counseling</u>

Counseling can be hampered by insufficient information regarding the etiology of the prior stillbirth. In many cases, the prior stillbirth may be unexplained despite a thorough evaluation. In patients in whom complete evaluation for previous stillbirth was not done, evaluation should be completed with parental permission. When specific risks are identified, the risk of recurrence may be quantifiable.

In low-risk women with unexplained stillbirth, the risk of recurrence stillbirth after 20 weeks is estimated at 7.8–10.5/1,000 with most of this risk occurring before 37 weeks of gestation. The risk of recurrent stillbirth after 37 weeks is very low at 1.8/1,000. In comparison, women with a history of a live birth complicated by preterm fetal growth restriction have a stillbirth rate of 21.8/1,000 in a subsequent pregnancy.

Rates of recurrent fetal loss are higher in women with medical complications such as diabetes or hypertension or in those with obstetric problems with a significant recurrence risk, such as placental abruption. Despite reassurances, the patient is likely to be anxious and to require ongoing support.

The next pregnancy

An unexplained stillbirth is a fetal death that cannot be attributed to an identifiable fetal, placental, maternal, or obstetrical etiology due to lack of sufficient information or because the cause cannot be determined at the current level of diagnostic ability. It is reported to account for 25 to 60 percent of all fetal deaths. On the other hand, that leaves approximately one third of IUFDs with a reasonable explanation of the etiology.

Stillbirths occurring near term are more likely to be unexplained than stillbirths occurring earlier in gestation. Two-thirds of unexplained fetal deaths occurred after 35 weeks of gestation in one series.

Explained stillbirth

During the subsequent pregnancy attention should be paid to those factors which could be explained in the previous IUFD. The risk of subsequent still birth is twice as high for women with a prior live born, growth restricted infant delivered before 32 weeks of gestation than for women with a prior stillbirth.

Fetal growth restriction — Death of a growth-restricted fetus is the second most common etiology of stillbirth. Placental dysfunction is the presumed cause of both growth restriction and death. The estimated risk of stillbirth for growth-restricted fetuses is three to seven times that of the normally grown fetus. In a multihospital study in the United States that included 527 stillbirths, the median gestational age at death of the growth restricted fetus was 28 weeks].

Conditions resulting in placental dysfunction can be recurrent, but the placental complications may manifest in different ways in different pregnancies. Growth restriction, preterm delivery, and stillbirth can all be sequelae of impaired placental function. The association between the birth of a small for gestational age infant in one pregnancy and stillbirth in a subsequent pregnancy has been reported in several studies. The risk of stillbirth in a subsequent pregnancy is particularly high if the small for gestational age infant was born preterm. Placental dysfunction can be related to maternal vasculopathies or intrinsic placental disease.

Abruptio placenta — Abruptio placenta occurs in approximately 1 percent of pregnancies but accounts for between 10 and 20 percent of all stillbirths.

Infection — Infection accounts for approximately 50 percent of stillbirths in low- and middle-income countries and 10 to 25 percent of stillbirths in high-income countries.

Congenital anomalies — Fifteen to 20 percent of stillbirths have a major malformation

Fetomaternal hemorrhage — Fetomaternal hemorrhage sufficiently large to cause fetal death has been reported in up to 5 percent of stillborns.

Umbilical cord abnormalities — Umbilical cord complications (eg, nuchal cord, knot, intrinsic cord abnormalities) are often cited as a cause of fetal death in the third trimester and accounted for 10 percent of 500 fetal deaths in one population-based study. Although nuchal cords and

knots are relatively common (occurring in 15 to 34 percent of pregnancies at term) vascular constriction sufficiently severe to kill the fetus rarely occurs. A nuchal cord or knot may provide the clinician and the patient with an immediate potential explanation for the fetal demise; however, the cause of death should be attributed to a cord complication only after a thorough search for other causes and when other findings support this diagnosis.

Uterine abnormalities — Uterine rupture is a rare but devastating cause of intrapartum stillbirth.

Structural uterine abnormalities, such as a unicornuate uterus, can be associated with cervical insufficiency, which can lead to early stillbirth and/or previable preterm birth.

Amniotic band sequence usually causes fetal deformation but may also result in stillbirth if the umbilical cord is constricted by a band.

Intrahepatic cholestasis of pregnancy

Maternal symptoms resolve promptly after delivery, but there is a 40-70% recurrence rate in subsequent pregnancies.

-Patients in our population with a history of a prior stillbirth should be considered for screening for ICP in the early third trimester.

Other common explained etiologies

Genetic abnormalities

Diabetes

Hypertensive disorders

Smoking, illicit drugs

Placental abnormalities

Hydrops fetalis

Fetal Arrhythmia

Platelet alloimmunization

Prevention

Some general risk factors for stillbirth are identifiable in the first trimester, including:

●Maternal medical disorders (See list above)

●Nulliparity

●Cigarette smoking

●Obesity

●Advanced maternal age

●Black race

●Previous stillbirth

●Previous small for gestational age newborn or abruption

●Social issues

●Recreational use of drugs

●Conception via assisted reproductive technology

Kick counts

Monitoring fetal movement has been suggested as a means of identifying fetuses in whom timely intervention will prevent death. Trials comparing fetal/neonatal outcome in mixed-risk populations of women randomly assigned to follow a formal program of fetal movement counting or routine care have not yielded conclusive results. Observational studies suggest monitoring fetal movement and promptly evaluating women with decreased fetal activity can improve pregnancy outcome.

If this method is to be used, then begin 2 weeks prior to EGA of previous stillbirth or at 32 wks.

Antenatal testing and Ultrasound

Growth US: 32 wks and 36 wks

Antenatal testing at 32 wks: Twice weekly NST and weekly AFI

Delivery

If not other co-morbidities, then evaluate for delivery at 39-40 weeks

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Resolve Through Sharing

Take home points for healthcare providers: Principles of care

- Parents who choose perinatal palliative care wish to parent their baby for as long as the baby lives. These parenting moments will bring them great joy, as well as a great sorrow. Engage with them in such a way that you can share these complex and varying emotions.
- Being obviously pregnant is seen in western culture as an invitation to ask personal and sometimes intimate questions. Help parents prepare for the inevitable excited queries, “When are you due? Is it a boy or a girl? Is it your first?”
- If the baby is born alive, provide care in the hospital (nursery or NICU) or at home that focuses on how the parents want the experience to be for them, their family, friends, and their baby. This includes the opportunity to be with their baby after death. Be mindful of opportunities for ritual and keepsake activities.
- Plan in advance for hospice or home care. If the baby goes home, make sure that the parents know how to reach a knowledgeable healthcare provider round the clock. Ensure that all of the appropriate documents (discharge summary, medication prescriptions, phone number list) accompany the baby and family.
- Include all those who need to know about the impending death (emergency medical providers, coroner, police, and funeral director) in the plan.
- Ask, “What symptoms are most concerning to you right now?” and be prepared to treat each one. Or ask, “What are your greatest concerns right now?”
- Provide written information using several different scenarios to describe what dying may be like. Think of all the senses.
- Provide guidance and resources on how to talk to other children about what is happening: the death, what to expect, the funeral; and how to create support for other children at school. Develop avenues or processes for communication between all participants to ensure the seamless provision of care for the baby and parents from the prenatal period through bereavement.

- Multiple situations over time call for parental decision. Ensure a process for supporting parents in the hospital and at home.
- Establish relationships with community agents who may be involved in the baby's care in the home environment.

Appendix 1: THE FIVE PROTECTIONS

DISBELIEF - Ignoring/Not Knowing/Not Remembering/Not Accepting/Not Trusting

HIDING EMOTIONS –

DESIRE – Wanting something to avoid having an uncomfortable feeling or emotion. (or getting caught in the **Desire-numbing substance-guilt/shame cycle**)

Asking the "WHY" question and answering…

"It's your fault." – Blaming others, using **ANGER**

"It's my fault." – Blaming yourself, using **GUILT-SHAME**

EFFORT – To **avoid** something or to **prove** something

FRAGMENTATION/DISSOCIATION –Feeling distracted, unable to concentrate, always wanting to be somewhere other than where you are, "spacing out".

REFUSAL/REBELLION/REVERSAL – Overly quick to be defensive/ Getting in your own way/Tending to do the opposite of what authority figures say/Refusing to give up, etc.

LIST THE PROTECTIONS YOU CIRCLED AND ADD **<u>HOW YOU KNOW</u>** THAT YOU HAVE USED AND/OR CURRENTLY USE THAT PROTECTION:

1. 2.

3. 4.

5.

If you are currently using a protection, think about what you might be protecting yourself from. Is the protection related to a stressor from the past or is it from a stressor currently in your life?