Following the Policy of the National Regulation 3.3, page 17, on CME disclosures, dated 5 November 2009, and on behalf of the Provider, - Collage S.p.A.- n. 309

I (TACHJAREE PANCHALEE) HERE DECLARE

DISCLOSURE OF RELEVANT FINANCIAL RELATIONSHIPS

NO, have no relevant personal financial relationship in the medical/health field.

DISCLOSURE OF PROMOTIONAL TALKS

YES, I have presented promotional talks for one or more pharmaceutical companies within the past 12 months

- NIPT (non-invasive prenatal testing): Harmony™, Roche Diagnosis (THAILAND)

I understand that continuing education accreditation guidelines prohibit me from accepting any reimbursement (financial, gifts or in-kind exchange) for this presentation from any source other than the accredited CME provider (Collage S.p.A.)

15-16 September, 2017

TACHJAREE PANCHALEE
Introduction

• The prevalence of thalassemia carriers in Thailand is approximately 40%

<table>
<thead>
<tr>
<th>Type</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>α thalassemia (α-thal 1 and α-thal 2)</td>
<td>20-30%</td>
</tr>
<tr>
<td>Hb Constant spring (α-thal 2 liked effect)</td>
<td>1-8%</td>
</tr>
<tr>
<td>β thalassemia</td>
<td>3-9%</td>
</tr>
<tr>
<td>Hemoglobin E</td>
<td>10-53%</td>
</tr>
</tbody>
</table>

CPG Thalassemia. Thalassemia Foundation of Thailand, 2013
Introduction

• Thalassemia screening in pregnancy
  • Establishing as a national policy for more than 20 years
  • Identifying couples at risk for major thalassemia diseases
  • Prenatal diagnosis for major thalassemia diseases

• Major thalassemia diseases
  • Bart’s hydrops fetalis
  • Homozygous beta thalassemia disease
  • Beta thalassemia/Hb E disease
Introduction

In our institute, Faculty of Medicine Siriraj Hospital

• Prenatal diagnosis (PND) for thalassemia was set up 30 years
  • Initial for couples with known affected offspring

• Current PND for thalassemia in Siriraj hospital
  • 350-380 couples are at risk for major thalassemia diseases per year, according to screening policy
  • 3-5 twin pregnancies per year
Objective

• To share our interesting experience of prenatal thalassemia diagnosis and management in twin pregnancy: A case presentation
Case presentation

• A 29-year-old nulliparous woman with a twin pregnancy
  • Non-transfusion dependent HbH CS disease ($\alpha^{SEA}/\alpha^{CS}$)
  • Her husband has alpha ($\alpha^{SEA}$) trait

**Couple at risk of homozygous $\alpha^{SEA}$ disease**

• $\alpha^{SEA}$ is the most common $\alpha$ thal-1 in Thailand
Case presentation

• Detailed ultrasonographic scan
  • Twin peak sign (Lambda sign)
  • Inter-twin membranes > 2 mm.
Case presentation

- Fetus on the left
  - Cardiomegaly
  - Pericardial effusion
  - Ascites
  - MCA-PSV > 1.5 MoM

- Fetus on the right
  - Normal scan concordant with gestational age

- Performing amniocentesis in both sacs
  - Amniotic fluid for DNA analysis with PCR technique
  - The results will be showed next 2 weeks
Case presentation

• Two weeks later, PCR was resulted
  • The left twin was affected with homozygous $\alpha^{\text{SEA}}$
  • The right twin was diagnosed with $\alpha^{\text{SEA}}$ trait

• Selective feticide was offered to decrease the risk of maternal and fetal complications
  • Intracardiac injection of 40-mL potassium chloride (2mEq/10mL) was performed in the fetus with the hydropic features
Case presentation

• Serial ultrasonographic scans were performed
  • For growth evaluation of the right fetus

• During this pregnancy;
  • The patient was anemic and needed transfusions every 4-5 weeks to keep hemoglobin > 8 g/dl
Case presentation

• At 30 weeks’ gestation
  • Pregnancy was complicated by preterm labor
  • Standard treatment was given (Corticosteroids and inhibition of labor)

• After 8 days of admission, the labor progressed
  • MgSO$_4$ was intravenously administered for fetal neuroprophylaxis
  • Vaginal delivery
    • A 1,620-gram female baby with Apgar scores of 7, 9
    • A small macerated dead fetus
Discussion: Prenatal diagnosis in twin pregnancy

• Twin pregnancy is at **higher risk** of bearing a child with genetic diseases

  Prenatal diagnosis in twins gestations. Seminars in Perinatology, 2012

• Chorionicity and amnionicity
  • Almost 100% accuracy in 1\textsuperscript{st} trimester determination
  • Should be defined before prenatal diagnosis

  First trimester ultrasound determination of chorionicity in twin pregnancy. Ultrasound Obstet Gynecol, 2011

• The dilemma in DCDA twins
  • One twin is normal and the other one affected
Discussion: Prenatal diagnosis of Bart’s disease in twin pregnancy

- **Early identification** of Bart’s fetus in singleton can be also applied in twins
  - Cardiomegaly (increasing of CTR)
  - Placentomegaly
  - MCA PSV > 1.5 MoM (fetal anemia)

Early ultrasound prediction of pregnancies affected by homozygous α-thalassemia. Prenat Diagn, 1997
Fetal middle cerebral artery peak systolic in the investigation of non-immune hydrops. Ultrasound Obstet Gynecol, 2004

- Ultrasonographic finding of **hydrops fetalis**
  - Generalized skin edema
  - Pleural, pericardial effusion and ascites

Discussion: Selective termination in DCDA twins

- Unlikely passage of substances from one twin into the co-twins
  - Lack of placental anastomoses

- The first step is to **identify precisely** the anomalous or affected fetus by ultrasound
  - Structural anomaly
  - Discordant gender
  - Placenta location

- Miscarriage rate increases with gestational age
  - 5.4% (9-12 weeks), 8.7% (13-18 weeks), 9.1% (> 25 weeks)

Selective reduction and termination of multiple pregnancies. Seminars in Fetal & Neonatal Medicine, 2010
Discussion: Fetal intracardiac potassium chloride (KCl) injection

- Transabdominal injection under ultrasound control into **left ventricle and atrium** before 26 weeks’ gestation or **umbilical vein** after 26 weeks’ gestation

- Can be used for termination in **all trimester**
  - Increasing doses with gestational age
  - Concentration of 2 mEq/mL
    - 2 mL before 16 weeks of gestations
    - 3-5 mL after 16 weeks of gestations

- The needle is left in place until 2 minutes of fetal asystole and reevaluation after 30 minutes

Managing twins discordant for fetal anomaly. Prenat Diagn, 2005
Conclusion

• **Prenatal diagnosis is ONLY** solution to prevent thalassemia major in the high prevalence area

• **Determination of chorionicity** should be done in first trimester of twin pregnancy

• **Identification of affected fetus** should be correctly confirmed before selective termination

• **Patient and family’s decision** bases on an adequate counseling
THANK YOU FOR YOUR ATTENTION! ANY QUESTIONS?