Chylothorax in a neonate and its treatment options

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ESI-PGIMSR.
• B/O Anandhi – first born baby at term by elective LSCS to G3A2 mother

• Uneventful antenatal period except - GDM on meal plan

• AN USG III trimester - isolated left pleural effusion confirmed at a higher center
At birth,

- APGAR 7/10 and 9/10 at 1&5 mins
- RS-Air entry reduced on left
- No respiratory distress
- B.wt- 3.5kg,length 49cm,HC-34cm

- No obvious anomalies
Course in NICU

• Maintaining saturation in room air
• USG chest:
  - left pleural effusion
  - collapse of left lung with mediastinal shift to right side
• Pleural tap done – diagnostic and therapeutic, 100ml aspirated
Day 1
Pleural fluid analysis

- Clear and transparent - yellow
- Cells- 1600 cells - **100 % lymphocytes**
- LDH ratio- 0.23
- Protein ratio- 0.6
- Cholesterol- 14 mg/dl
- TGL - 159 mg/dl

---------- "CHYLE" ----------

- Culture- sterile
- AFB- Negative
CT CHEST:-

• Small effusion with collapsed lung

• No abnormal mass/dilated structure along the expected course of thoracic duct
- Supportive management
- Started on feeds after 48hrs

- Clinically e/o re-accumulation
- USG guided aspiration- 30 ml
- Fluid rapidly Reaccumulating
- Tapping done when there was mediastinal shift/ respiratory distress – aspirated 4 times
Before...
After .....
# Pleural fluid analysis

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<th>15/7/13</th>
<th>20/7/13</th>
<th>25/7/13</th>
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<tr>
<td>Protein gm/dl</td>
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<td>LDH ratio</td>
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<td>Protein ratio</td>
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<td>Cell count/ cytology</td>
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<td>culture</td>
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<td>TGL level mg/dl</td>
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<td>Cholesterol Mg/dl</td>
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<td>33.3</td>
<td>38.9</td>
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</table>
Diagnosis

- Idiopathic chylothorax
  - ? Leak from duct
  - ? Disruption of thoracic duct

- Baby clinically stable – managed conservatively.
Repeat CT chest

- Thoracic duct visualised better
- No pleural effusion
Chylothorax in newborn

- First reported in 1917 by Pisek*
- Incidence-1/1,50,000

- Chyle is milky fluid rich with fat secreted from the intestinal cells and lymphatic fluid.

- Chylothorax - accumulation of chyle in the pleural space

Etiology

- Congenital
- Traumatic
- Non traumatic
- T4 is the landmark
Congenital chylothorax

Incidence- 1 /20,000 pregnancies

- Birth trauma - most common
- Down's syndrome
- Noonan's syndrome
- Maternal polyhydramnios
- Lymphangiomatosis
- Congenital lymphangiectasia
- H-type tracheo-esophageal fistula
- Thoracic duct hypoplasia and atresia
Causes cont..

Traumatic
• Surgical-head and neck surgery
• Invasive diagnostic and therapeutic procedures
• Subclavian vein catheterization
• Hyperextension or stretching of chest wall or thoracic spine

High central venous pressure
• Thrombosis of the superior vena cava or subclavian vein

Miscellaneous
• Benign tumors/malignancies/ lung malformations
• Tuberculosis/ Histoplasmosis/ Sarcoidosis
• Forceful vomiting
Principles of treatment

- Relief of distress
- Preventing dehydration
- Nutrition
- Reducing fat in diet
- Reducing splanchnic circulation
Index neonate..

- Stabilization

- Feeds - breast feeds, EBM with parenteral nutrition

- MCT supplementation

- Special formula – ALFARE

- Octreotide 30µ s.c tds
Special formula!

• Initial – soya based formula
• MCT based formula – ALFARE
• **Composition** - Maltodextrin, enzymatically hydrolysed whey protein, *medium chain triglycerides (40%)*, potato starch, palm olein, low erucic rapeseed oil, sunflower oil, citric acid ester of mono & diglycerides (from plant source), blackcurrant seed oil, calcium glycerophosphate, fish oil, choline bitartrate, nucleotides, taurine, inositol, L-carnitine, etc

• Low fat formula
• Showed improvement
Role of octreotide

• Acts on somatostatin receptors - reduce splanchnic blood flow
• Reduces volume of gastrointestinal secretions - decreases volume and protein content of lymph
• IV dose - 0.3 - 10µ/kg/hr
• Duration – max 3 weeks
• Side effects - glucose intolerance, cholestasis, liver/renal impairment, hypothyroidism, NEC
• Need for larger trials
chest tube vs. Octreotide
Indications for surgery

Selle et al,
• fluid exceeds 100 ml /kg for 5 days....

• Chyle leak greater than 1 L/d for 5 days or a persistent leak for more than 2 weeks despite conservative management

• Nutritional or metabolic complications, including electrolyte depletion and immunosuppression

• Loculated chylothorax, fibrin clots, or trapped lung

• Postesophagectomy chylothorax
Modes of surgical treatment

- Thoracic duct ligation - right thoracotomy or through a thoracoscope.
- Refractory chylothorax - pleuroperitoneal shunt
- Malignant chylothorax - Pleurodesis
- Surgical pleurectomy
Follow up..

- Serial USG monthly - no e/o fluid reaccumulation
- Total resolution in 60 days.

Currently,
- Weight gain +
- Clinically improved
- Thriving well.
At 3 months
Chylothorax - Outcome

- More than 80% respond to non-operative in less than 4 weeks.

- Prognosis depends on the underlying etiology.
Our experience

• Two cases last 1 year
• Hydrops with bilateral Chylothorax-associated with lung malformation-Expired

Elsewhere,
Idiopathic-Chylothorax -Octreotide given
References

- Octreotide for the treatment of chylothorax in neonates (Review) - Cochrane database
- Stacey, Nutritional Management of Chyle Leaks: An Update, practical gastroenterology, APRIL 2011
THANK U