Amniotic fluid abnormalities: Poly and oligo - What to do?

William M. Gilbert, MD
Regional Medical Director,
Women’s Services
Sutter Health, Valley Region

- The speaker has no financial conflicts of interest

Introduction

- Definitions
  - What is normal
  - Oligohydramnios
  - Polyhydramnios
  - Pregnancy outcomes
  - Treatment options
  - Delivery options

The best clinical test for determining amniotic fluid volume is

A. Leopold’s Maneuvers
B. Amniotic fluid index (AFI)
C. Largest vertical pocket (LVP)
Isolated Oligohydramnios is NOT associated with worst pregnancy outcomes

A. True  
B. False

51% 49%

Isolated polyhydramnios is NOT associated with worst pregnancy outcomes

A. True  
B. False

59% 41%

---

Normal AF volume

- Brace and Wolf AJOG (1989)
- Actual measurement
- 705 separate pregnancies
- Gestational age dependent

---

Figure 1: Nomogram showing amniotic fluid volumes as a function of gestational age. Dots are means for two-week intervals from 705 women. Percentiles are calculated from polynomial regression equation and standard deviation of means. Shaded area covers 95% confidence interval. Reprinted with permission from Brace and Wolf.
Clinical Assessments of AF Volume

- Leopolds - Hands on!!
- Actual measurement – invasive (amniocentesis)
- Ultrasound
  - Largest vertical pocket of AF, (LVP, DVP, MVP)
  - 2 diameter pocket
  - Amniotic Fluid Index (AFI)
Deepest Vertical Pocket (DVP)

- Oligohydramnios - < 2 cm
  - Severe oligohydramnios < 1 cm
  - Mild oligohydramnios < 2 cm, > 1 cm
- Normal – 2 to 8 cm
- Polyhydramnios
  - Mild polyhydramnios - > 8 cm < 12 cm
  - Moderate polyhydramnios - > 12 cm < 16 cm
  - Severe polyhydramnios - > 16 cm
Nabhan et Abdelmoula. AFI vs SDP as a screening test for preventing adverse pregnancy outcome. Cochrane database (2010)

- Five trials (3226 women)
- AFI vs SDP – Neither method was superior but
  - AFI more Dx of oligohydramnios - OR 2.39 (1.7, 3.3)
  - More inductions - OR 1.9 (1.5, 2.5)
  - More C/S for fetal distress - OR 1.5 (1.1, 2.0)

Best Test for Determination of AFV
Perinatal Outcomes

- Oligohydramnios – anhydramnios
  - 75 to 100% PMR
  - Renal agenesis, obstructive uropathy

- Polyhydramnios – marked
  - 75 to 100% PMR
  - Bowel Obstruction, genetic, TTTS

Oligohydramnios - Outcomes

- Increase in adverse perinatal outcome
  - 2.0 vs 109 deaths/1000
  - < 1 cm vs. < 2 cm but < 8 cm
  - 40% IUGR
  - Cord compression
  - Uteroplacental insufficiency
  - Meconium

Oligohydramnios - Outcomes

- Old studies included
  - Structural abnormalities
  - IUGR, SGA
  - Postmaturity syndrome
  - Maternal conditions
  - Led to inductions with low AFI

Adverse outcomes

- Morris et al. Association and prediction of AF measurements for adverse pregnancy outcome: Systematic review and meta-analysis. BJOG (2014)
  - 43 studies 244,493 fetuses
  - Results
  - Oligohydramnios strong association with:
    - SGA OR 6.3 (4.15, 9.58)
    - Neonatal Mortality 8.7 (2.4, 31.2)
    - PMR OR 11.5 (4.1 32.9)
**How About Isolated Oligohydramnios?**

- Transient finding Lagrew et al. (1992)
  - 3-4 days later 41% normal
  - AFI good for 7 days
  - Post dates AFI twice a week
  - Clement et al (1987)

**Isolated Oligohydramnios**

- Conway et al (1998) 183 patients
  - Isolated oligo induction matched to
    - Spontaneous labor with normal AFI
  - No difference in gest age, race, parity
  - Neonatal outcomes no different
  - Induction C/S rate 16% vs 7%
  - Conclusion: Induction not indicated

**Isolated Oligohydramnios**

- Rainford et al (2001) 232 > 37 weeks
  - AFI < 5 cm (19%)
  - No difference in:
    - OVD, NICU, Low Apgars at 5 min
  - Normal AFI
    - fewer inductions
    - MORE meconium 35 vs 16%

**Isolated oligohydramnios**

  - Retrospective 27,708 patients, into three groups
    - Induction because of oligo
    - Spontaneous labor with normal AFV
    - Postdate inductions with normal AFV
  - C/S and SGA in oligo increased compared to both
  - Conclusion: Question induction for oligo
**Polyhydramnios**

* 113 cases of polyhydramnios Golan et al (1994)
* 65 remained poly, 48 returned to normal

<table>
<thead>
<tr>
<th>Morb/Mort</th>
<th>OR</th>
</tr>
</thead>
<tbody>
<tr>
<td>PIH</td>
<td>2.7</td>
</tr>
<tr>
<td>PTD</td>
<td>2.7</td>
</tr>
<tr>
<td>C/S</td>
<td>4.0</td>
</tr>
<tr>
<td>IUFD</td>
<td>7.7</td>
</tr>
<tr>
<td>Neo Death</td>
<td>7.7</td>
</tr>
</tbody>
</table>

**Adverse Outcomes**

* Morris et al. (2013) Association and prediction of AF measurements for adverse pregnancy outcome: Systematic review and meta-analysis. BJOG (2014)

* Polyhydramnios
  * LGA fetuses OR 11.4 (7.1, 18.4)
  * Despite strong associations with poor outcomes: they do not accurately predictive outcomes for individuals

**Isolated polyhydramnios**

* Retrospective study 31,376 > 34 week
  * 215 with isolated polyhydramnios (AFI > 25 cm)
* Pregnancy outcomes – increase in:
  * Induction OR 1.7 (1.01, 2.8), Cesarean OR 2.6 (1.7, 4.0)
  * Shoulder dystocia OR 3.4 (1.2, 9.7), Prolonged 1st Stage OR 3.6 (2.0, 6.7), Abruption OR 8.4 (2.0, 35)
  * Mild poly (AFI 25.0 to 30) Still increased

**Polyhydramnios Treatment**

* Amnioreduction – Kleine et al. (2016)
  * Singleton IUP with Severe polyhydramnios
  * With and without maternal symptoms
  * Retrospective 135 patients
    * 44 needed amnioreduction
  * No difference in Maternal or newborn outcomes
Polyhydramnios Treatment

- Retrospective study of amnioreductions
- 138 patients with polyhydramnios (LVP > 8 cm)
  - 271 reductions, Median age 31.4 weeks and 1 procedure
  - 45.6% required > 1 procedure, Volume 2100 ml
  - Medium duration 26 days between procedures
  - Medium Del 36.4 weeks, 2 dels within 48 hours
  - Amnioreduction was useful and safe procedure

Final Diagnosis

- GI malformations 21%
- Idiopathic 20.3%
- Chromosomal abnormalities 15.2%
- Syndromic condition 13.7%
- Neurologic condition 8%

Polyhydramnios Treatment

- Oligohydramnios, 2 liters of water
- Increased AFI 3.5 cm
- Normal AFI (Kilpatrick et al 1993)
  - Increased AFI 1.6 cm
  - Increased AFI in oligo but not normal

Intravenous hydration
- Doi et al (1998) > 35 wks AFI < 5 cm
  - PO vs IV isotonic or hypotonic
  - 2 liters/2 hours
  - Osmotic change more important than volume
  - Oral or IV increase AFI

Treatment Options Oligohydramnios

Treatment Options

  - Oligohydramnios, 2 liters of water
  - Increased AFI 3.5 cm
  - Normal AFI (Kilpatrick et al 1993)
    - Increased AFI 1.6 cm
    - Increased AFI in oligo but not normal
Oligohydramnios Treatment

- RCT of isolated oligo (66 with Oligo, 71 controls)
- 6 days of IV 1500 ml isotonic per day.
- NST, AFI, BPP days 0 and 7
- Change in AFI 3.9 cm to 7.7 cm, control unchanged
- Oligo group then RCT to oral 1500 vs 2500 ml
  - At delivery AFI 8.6 vs 11.2 cm
  - Conclusion – Hydration works

Treatment Options

- Contraction Stress Test
  - “Stresses” the fetus
  - Good for one week
  - May put into labor

Summary and Conclusions: Polyhydramnios

- Is it true polyhydramnios? Check LVP
- Ultrasound for anatomy
- Check diabetes screen
- If real and/or persistent, Antepartum testing
- Watch for LGA

Summary and Conclusions: Oligohydramnios

- Ultrasound only method of diagnosis
- LVP better than AFI
- If AFI is low (< 5 cm), Check LVP. If normal OK
- Major cause for induction in US today
- Poor pregnancy outcome in older studies
  - Included malformations, IUGR, Maternal disease
- If isolated oligohydramnios and AGA:
  - Oral hydration and OK to wait
Summary and Conclusions:

- Isolated Oligohydramnios before 40-41 wks
  - Hydration, 2 liters minimum per day
  - Ultrasound to rule out IUGR (Doppler)
  - If LVP low (< 2 cm) at term, consider above or induction

The best clinical test for determining amniotic fluid volume is

A. Leopold’s Maneuvers
B. Amniotic fluid index (AFI)
C. Largest vertical pocket (LVP)

Isolated Oligohydramnios is NOT associated with worst pregnancy outcomes
A. True
B. False

Isolated polyhydramnios is NOT associated with worst pregnancy outcomes
A. True
B. False