

## Late Preterm Birth: Perspectives from Perinatology

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## Background

- Late preterm birth (LPTB) occurs between 34 wks+ 0 days and 36 wks+ 6 days
- PTB rate (between 24 and 37 wks)
  - 12.3% in 2008
  - 12.7% in 2007
  - 12.8% in 2006
  - 12.7% in 2005

## Percentage of preterm births: US, final 1990, 2005, 2005, 2006, and preliminary 2007-2008

Year	Total PTB	Late PTB	Less than 34 weeks		
			Total	32-33 wks	< 32 wks
2008	12.33	8177	3.56	1.57	1.99
2007	12.66	9.03	3.63	1.59	2.04
2006	12.80	9.14	3.66	1.62	2.04
2005	12.73	9.09	3.63	1.60	2.03
2000	11.64	8.22	3.42	1.49	1.93
1990	10.61	7.30	3.32	1.40	1.92

Hamilton BE, Martin JA, Ventura SJ. Births: preliminary data for 2008. National Vital Stat Rep 2010;58(16).

## Outcomes in LPTB

- Bastek et al (2008)
  - Assess risk of delivering at 32-33+6/7 wks vs 34-36+6/7 wks vs  $\geq 37$  wks
  - 400 singleton pregnancies enrolled with PTL, between 24 and 34 weeks GA, given tocolysis and steroids
  - Excluded in final analysis: 110 (27.5%) delivered <32 wks, 16 (4%) major anomalies, 10 (2.5%) no follow-up info

## Outcomes in LPTB

- Bastek et al (2008,) cont
  - Acute morbidities vs longer-term morbidities requiring persistent use of health care resources beyond neonatal period plus adverse neurodevelopment indicators
  - Preterm and late preterm cohorts had increased risk ratio of both acute and longer-term morbidities compared to term infants

## Outcomes in LPTB

- Lubow et al (2009)
  - Compare short-term neonatal outcomes in LPTB vs full-term deliveries
  - 149 late preterm infants, 150 term infants
  - All spontaneous - none iatrogenic
  - Significantly longer hospital stays, higher rates of NICU admissions, hyperbilirubinemia, and respiratory problems in the LPTB group

### Factors contributing to late PTB

- Cesarean delivery (C/D) trends
  - Total rate rose from 5% in 1970 to almost 25% in 1988
  - NIH and ACOG encouraged efforts to decrease cesareans unless medically necessary and increase vaginal birth after cesarean (VBAC) rate
  - From 1989-2005, C/D rate fell, but concurrently, more high-risk pregnancies and reports of VBAC complications

### Factors contributing to late PTB

- Cesarean delivery (C/D) trends, cont
  - Subsequent increase in C/D rate and decrease in VBAC rate
  - Total rate rose from 20.7% to 30.3% in 2005 (driven mostly by primary cesarean rate)
  - As C/D rate started to rise again, PTB rate followed, except for small decrease from 11.8% to 11.6% from 1999-2000

### Factors contributing to late PTB

- Increased medical surveillance/interventions
  - Antenatal testing
- Inaccurate dating
  - LMP and second trimester sono dating accurate within 1-2 weeks
  - ART, first trimester sono dating accurate within 3-5 days

### Factors contributing to late PTB

- Advanced maternal age
  - Increased risk of hypertensive disorders, DM
- Assisted reproduction
  - More multifetal pregnancies
- Patient choice – planned labor or cesarean (estimated 2.5% percent of US births are C/D by maternal request)

### Factors contributing to late PTB

- Maternal obesity
  - Increased risk of hypertensive disorders, DM
  - Association with macrosomia and inaccurate estimation of GA by sono
- Physician practice patterns
  - Convenience, liability
- No intervention (tocolytics, steroids) beyond 34 weeks

### Clinical management practices

- Managing complications in pregnancy requires assessment of maternal and fetal risks involved in continuing pregnancy or immediate delivery
- Current guidelines do not recommend tocolysis or steroids beyond 34 weeks
- For cases of PPROM at 34 weeks or more, recommendation is for delivery

### Clinical management practices

- Maternal hypertensive disease
  - Affect 6-10% of pregnancies
  - Definitive treatment for preeclampsia is delivery
    - Expectant management for mild disease until term
    - Preterm delivery in severe disease
    - Delivery for maternal distress or non-reassuring antepartum testing

### Clinical management practices

- Placental disorders – abruption, previa, accreta
  - Supportive care and expectant management in stable patients before 34 wks
  - After 34 wks, delivery recommended if patient labors or development of significant bleeding
  - Documentation of fetal lung maturity at 36-37 weeks, followed by delivery

### Clinical management practices

- Prior classical cesarean delivery
  - Concern for uterine rupture if patient labors
- Intrahepatic cholestasis of pregnancy (ICP)
  - Concern for sudden fetal demise (1-5% incidence in some studies)

### Clinical management practices

- IUGR
  - Many fetuses are constitutionally small
  - True growth restriction: suboptimal intrauterine growth
    - Maternal disease
    - Malnutrition
    - Tobacco/illicit drug use
    - Low socioeconomic status
    - Multiple gestation
    - Viral infections
    - Aneuploidy
    - Teratogens
    - Genetic syndromes

### Clinical management practices

- IUGR, cont
  - Increased risk for:
    - Antepartum, intrapartum, and neonatal complications
    - Oligohydramnios
    - Abnormal intrapartum fetal monitoring
    - Cesarean delivery
    - Low Apgar scores

### Clinical management practices

- IUGR, cont
  - Potential neonatal complications
    - Hyperbilirubinemia
    - Polycythemia
    - Hypoglycemia
    - Temperature instability
    - Seizures
    - Sepsis
    - Neonatal death

### Clinical management practices

- IUGR, cont
  - Before 34 weeks, expectant management with frequent testing
    - Deliver if testing results suggest fetal acidosis or abnormal venous Doppler evaluation
  - Deliver beyond 34 weeks if maternal hypertension also present
  - Antepartum surveillance – serial growth scans, umbilical vessel Doppler, BPP, NST

### Clinical management practices

- Multiple gestations
  - In 2005, twins accounted for 32.2 per 1000 live births
  - Average 3% yearly increase in number of twin gestations from 1980-2005
  - Triplet, quadruplet, and other higher-order births increased > 400% from 1980-1998

### Clinical management practices

- Multiple gestations, cont
  - Increased risk for PTD and PPRM
  - Average GA at delivery, 2005: twins 35.3 wks, triplets 32.3 wks, quads 29.9 wks
  - Increased incidence of preeclampsia and IUGR

### Clinical management practices

- Multiple gestations, cont
  - Prospective risk of fetal death for twins at 36-37 wks comparable to IUFD risk in singleton post-term pregnancy
    - Monochorionic twins have even greater risk – Lee et al (2008) noted risk for fetal death in apparently normal monochorionic twins was lowest at 34 wks
  - ACOG practice bulletin on multiple gestations notes “fetal and neonatal morbidity and mortality begin to increase in twin and triplet pregnancies extended beyond 37 and 35 weeks, respectively”

### Are current practices modifiable?

- Prophylactic antibiotics
  - Increase latency
  - Naef et al (1998) noted increased risk infection, prolonged maternal hospitalization, decreased umbilical cord pH at delivery in patients expectantly managed beyond 34 weeks
  - This was prior to common practice of prophylactic antibiotics
  - If patients remain stable, is it possible to continue expectant management beyond 34 weeks?

### Are current practices modifiable?

- Holland et al 2009
  - 514 late PTB
    - Spontaneous 36.2%
    - PPRM 17.7%
    - Medically indicated 37.9%
    - Elective 8.2%
  - 17% of late PTBs were potentially avoidable (elective or medically stable but high-risk conditions)

### General measures to prevent prematurity

- Preconceptional primary preventive methods
  - Public awareness of consequences of PTB
  - Optimization of nutrition
  - Smoking cessation
  - ? Periodontal care

### General measures to prevent prematurity

- Postconceptional primary preventive methods
  - Nutritional supplements
  - Smoking cessation
  - Early obstetric care
  - Screening
  - ? Periodontal care

### General measures to prevent prematurity

- Periconceptional preventive methods
  - Limit number embryos transferred at IVF
  - Monitor ovarian stimulation
  - Cancel cycles with large numbers of mature follicles
  - Multifetal pregnancy reduction

### General measures to prevent prematurity

- Preconceptional secondary preventive methods
  - Repair of uterine anomalies
  - ? Antibiotics

### General measures to prevent prematurity

- Postconceptional secondary preventive methods
  - Preeclampsia prevention in at-risk patients
  - Nutritional supplements
  - Close prenatal monitoring
  - Progesterone
  - Cerclage
  - ? Antibiotics
  - ? Reducing activity

### General measures to prevent prematurity

- Postconceptional tertiary preventive methods
  - Early diagnosis
  - Acute tocolysis
  - Corticosteroid administration
  - GBS prophylaxis
  - Management of PPROM

## Considerations for future research

- Well-designed, adequately powered studies to determine reasons for increased PTB and C/D rates
- Investigate alternative management strategies for PPROM at 34 weeks and beyond
- Explore possible benefits of short-term tocolytics in spontaneous PTL > 34 wks in order to administer steroids
- Examine the perinatal outcomes of multiples delivered in the late preterm period, optimizing antepartum testing strategies

Questions???

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