

Risk factors for delayed onset of lactogenesis among northern California primiparous women

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Presenter Disclosures

Laurie Nommsen-Rivers

- (1) The following personal financial relationships with commercial interests relevant to this presentation existed during the past 12 months: **No relationships to disclose**

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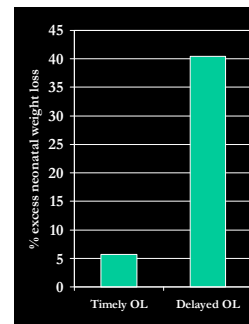
Background: Lactogenesis

- Stage I lactogenesis
 - Occurs during pregnancy
 - Preparation of mammary gland to make milk
- Stage II lactogenesis
 - Onset of copious milk production
 - In humans, cascade triggered by expulsion of placenta
 - "Secretory activation" or "second milk" coming in
- Delayed onset of stage II lactogenesis
 - "Delayed OL"
 - Maternal perception of onset after 72 hours postpartum
 - Validated indicator (Dewey, 2003; Chapman, 1999)

Delayed onset of lactogenesis in first-time mothers, Nommsen-Rivers 2009

Background: Short-term consequences of delayed OL

- Excess infant weight loss by day 3
 - $\geq 10\%$ of birth weight
 - 7-fold greater risk if delayed OL
 - Dewey, Nommsen-Rivers et al. *Pediatrics* 2003



Delayed onset of lactogenesis in first-time mothers, Nommsen-Rivers 2009

Background: Long-term consequences of delayed OL

- Connecticut, Chapman et al. 1999:
 - BF duration 11.7 vs. 3.4 months in those with timely vs. delayed OL ($p < 0.00001$) in women who planned to BF for at least 6 months
- California, Nommsen-Rivers et al., 2009:
 - BF prevalence at 6 weeks was 77% vs. 54% in those with timely vs. delayed OL ($p < 0.05$), controlling for ethnicity & feeding intentions

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Background: Identified correlates with delayed OL

- Primiparity
 - Chen, 1998; Chapman, 1999; Hildebrandt, 1999; Grajeda, 2002; Dewey, 2003; Scott, 2007
- Birth experience factors
 - Vestermark, 1991; Chapman, 1999; Hildebrandt, 1999; Grajeda, 2002; Dewey, 2003; Scott, 2007; Nommsen-Rivers, 2009
- Maternal overweight or obesity
 - Chapman, 1999; Rasmussen, 2001; Dewey, 2003; Nommsen-Rivers, 2009

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Background: Research gaps

- ▣ Limited range of study subjects across age, ethnic, education, and body size categories
- ▣ Lack of standardized, timely assessment of OL
- ▣ Weight and height estimated



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Today's objectives

- Present the risk factors for delayed OL in a cohort of women:
 - **Primiparous**
 - **Largest** sample to date
 - **Diverse** cohort



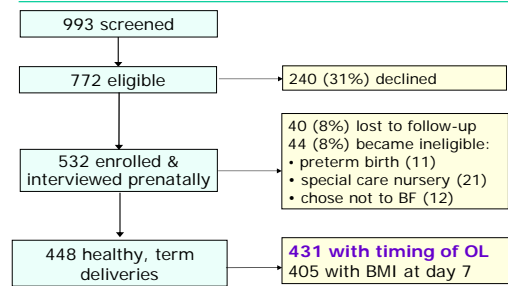
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Study design

- Prospective cohort study at UC Davis Medical Center, Sacramento, CA, Jan 2006 – Dec 2007
- Selection criteria:
 - Expecting first live-born infant, single fetus
 - 32-40 wk gestation at enrollment / prenatal interview
 - > 18 years old or able to obtain parental consent
 - Speaks either English or Spanish
 - Lives within 8-mi radius of the UC Davis Medical Center
 - Not a medical referral to the UC Davis Medical Center
 - No known absolute contraindication to breastfeeding

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Sample size



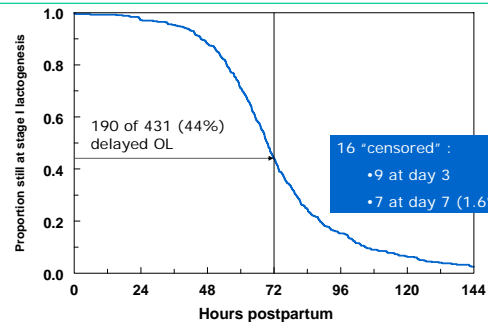
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Characteristics of participants, n (%)

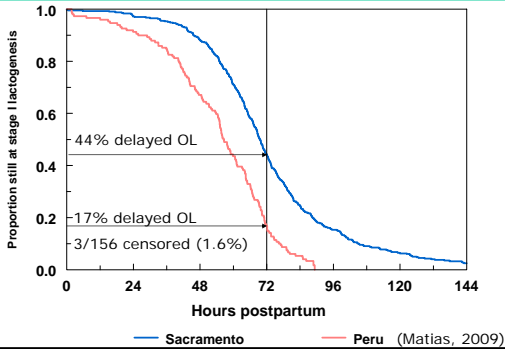
Maternal Age		Ethnicity	
<25 y	211 (47)	Asian	57 (13)
25-29.9 y	114 (25)	Black	62 (14)
> 30 y	123 (27)	Hispanic	119 (27)
		White	183 (41)
		Mixed	27 (6)
Education		Health insurance	
< High school	78 (17)	Private	229 (52)
HS diploma	99 (22)	Public	215 (48)
Some college	110 (25)		
College grad.	161 (36)		

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Timing of onset of stage II lactogenesis



Timing of onset of stage II lactogenesis



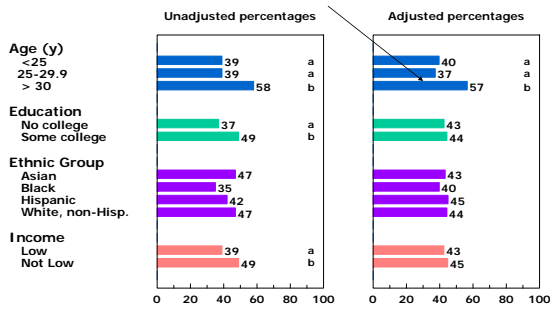
Results: Unadjusted relationships with delayed OL

- Maternal characteristics
- Infant characteristics
- Labor and delivery experience
- Breastfeeding practices



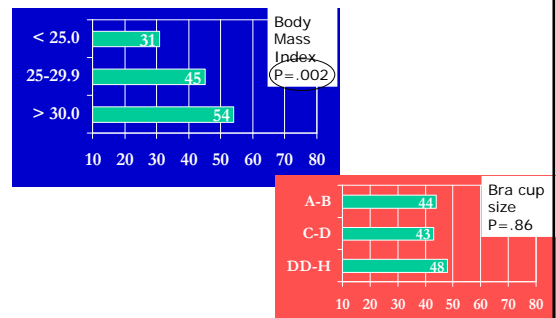
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Delayed OL (%) by maternal characteristics



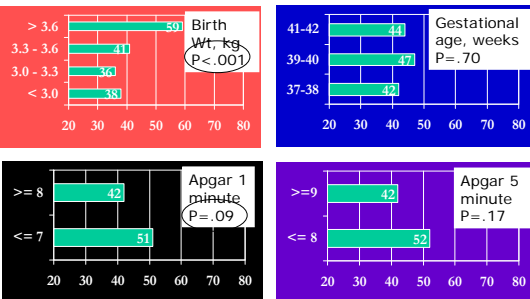
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Delayed OL (%) by maternal characteristics



Delayed onset of lactogenesis in first-time mothers, Nommsen-Rivers 2009

Delayed OL (%) by infant characteristics

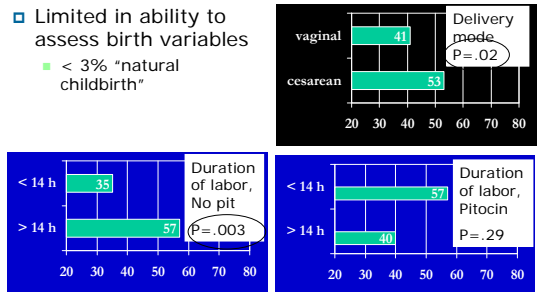


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Delayed OL (%) by birth experience

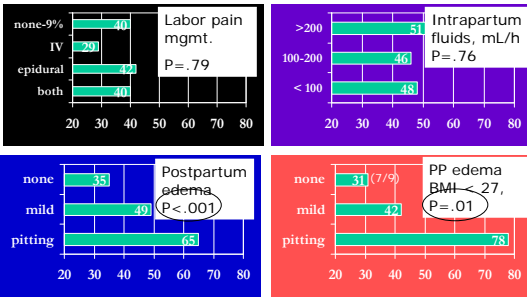
- Limited in ability to assess birth variables

< 3% "natural childbirth"



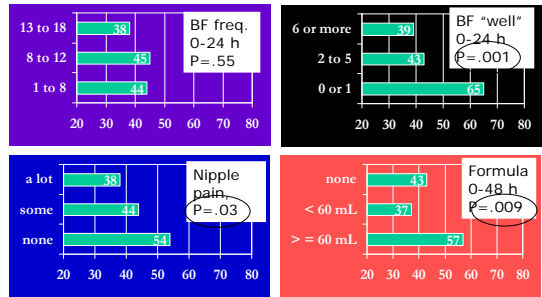
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Delayed OL (%) by birth experience



Delayed onset of lactogenesis in first-time mothers, Nommsen-Rivers 2009

Delayed OL (%) by breastfeeding experience, days 0-3



Delayed onset of lactogenesis in first-time mothers, Nommsen-Rivers 2009

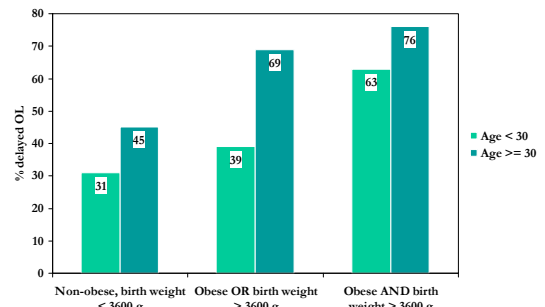
Logistic regression Odds Ratios (OR) for delayed onset of lactogenesis

Effect	OR	AOR*	95% CI
Maternal Age			
≥ 30 vs. < 30 y	2.2	2.8	1.7 – 4.7
Body Mass Index			
25–29.9 vs. < 25.0	1.7	1.8	1.1 – 3.2
≥ 30.0 vs. < 25.0	2.6	2.2	1.2 – 3.9
Birth weight			
> 3.6 vs. ≤ 3.6 kg	2.5	2.3	1.4 – 3.7
BF well, 0-24 h			
0, 1 vs. 2 or more	2.6	2.2	1.1 – 3.9
Peak nipple pain			
none/mild vs. mod/sev	1.9	1.8	1.1 – 3.0

*includes adjustment for all variables shown and prenatal BF intentions

Delayed onset of lactogenesis in first-time mothers, Nommsen-Rivers 2009

Additive effects of age, obesity, and high birth weight on delayed OL risk



Delayed onset of lactogenesis in first-time mothers, Nommsen-Rivers 2009

Summary

- ▣ 44% experienced OL on day 4 or later
- ▣ Significant risk factors in an adjusted model
 - Older maternal age
 - Maternal obesity
 - Infant birth weight > 3.6 kg
 - Lack of infant breastfeeding well in the first 24 hours
 - Lack of any nipple discomfort
 - Postpartum edema (in model without BMI)
- ▣ Limited in our examination of birth experience effects on delayed OL

Delayed onset of lactogenesis in first-time mothers, Nommsen-Rivers 2009

Conclusions

- ▣ Risk factors for delayed OL are increasingly more common among U.S. primiparas
- ▣ Maternity care practices influence timing of OL
- ▣ Delayed OL is experienced during the “doughnut hole” of breastfeeding support
- ▣ As recommended by the AAP committee on Breastfeeding:
 - BF dyads should receive follow-up evaluation at 3-5 days postpartum by a health care professional knowledgeable about BF

Delayed onset of lactogenesis in first-time mothers, Nommsen-Rivers 2009

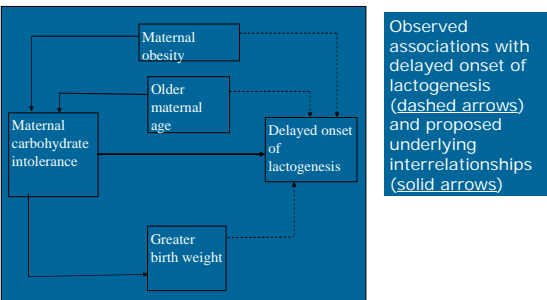
Acknowledgments

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- The mothers and infants who participated in the study

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Supplementary slides

Underlying mechanism?



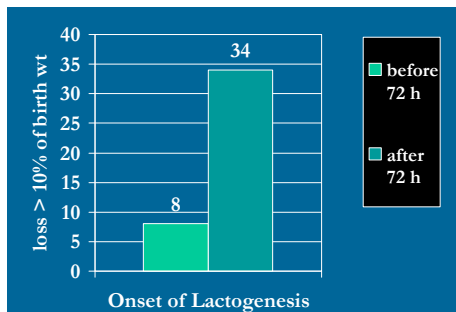
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Model II, with edema variable, without BMI: Adjusted Odds (95% CI) of delayed OL

Effect	AOR	95% CI
Mat. Age ≥ 30 vs. < 30 y	2.1	1.3 - 3.3
Birth wt > 3.6 vs. ≤3.6 kg	2.2	1.4 - 3.4
Edema		
Mild vs. none	1.6	1.0 – 2.5
Pitting vs. none	2.5	1.2 – 5.0
Formula > 60 vs. 0–60 mL	2.0	1.3 - 3.1

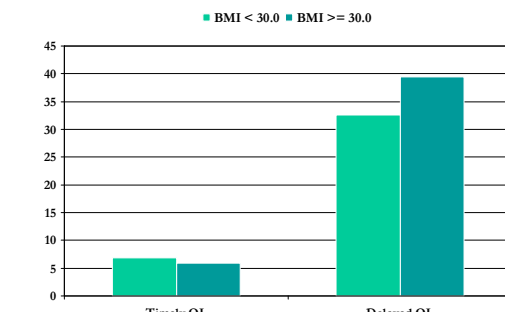
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Risk of excess neonatal weight loss by onset of lactogenesis



Delayed onset of lactogenesis in first-time mothers, Nommsen-Rivers 2009

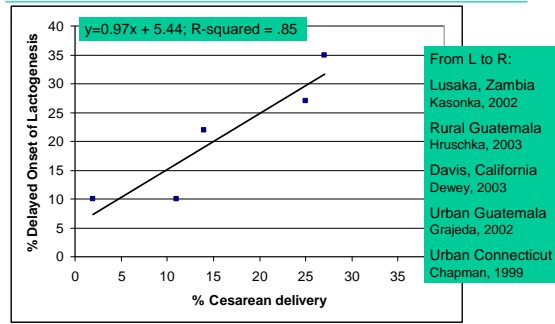
Risk of excess neonatal weight loss by onset of lactogenesis and obesity



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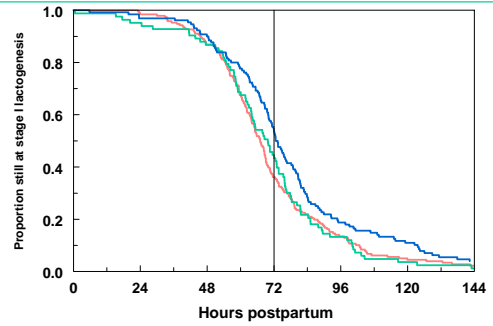
Background: ecologic analysis of delayed OL by birth setting

Nommsen-Rivers, Dewey, et al., *JOGNN* 2009



Delayed onset of lactogenesis in first-time mothers, Nommsen-Rivers 2009

Delayed OL survival curve by BMI



Delayed onset of lactogenesis in first-time mothers, Nommsen-Rivers 2009