CO-SLEEPING MOTHERS MORE COMPLIANT WITH BACK-TO-SLEEP RECOMMENDATIONS

Analysis of the 1998-1999 Oregon PRAMS Data Set

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Abstract

**Background:** Reduction of prone infant sleep position has been the main public health effort to reduce the incidence of Sudden Infant Death Syndrome (SIDS). Co-sleeping is a proposed, and controversial, risk factor for SIDS; non-standard sleep surfaces and non-maternal co-sleepers have also been proposed. Conversely, co-sleeping may enhance bonding and breastfeeding.

**Study Question:** This study was intended to identify important determinants of prone sleep positioning among Oregon women.

**Methods:** Oregon Pregnancy Risk Assessment Monitoring System (PRAMS) surveys a stratified random sample of women after a live birth. In 1998-1999, 1867 women completed the survey (64.0% response). Fifty-three women were excluded from analysis, as their babies were no longer alive or living with them. Of the remaining women, 1732 answered the sleep position question (97.5%) and 1758 answered the co-sleeping question (99%). Lateral and supine sleep responses were combined. Change-in-point-estimate logistic regression was utilized for model building.

**Results:** Overall, 9.2% of the respondents “usually” chose prone infant sleep position, while 24.2% chose side and 66.5% chose supine positioning. Co-sleeping was common; 18.8% never, 38.7% sometimes, 16.1% almost always and 26.5% always co-slept. Never co-sleeping with one’s infant was a significant predictor of prone position; these women more often chose prone position (13.5%) than women sometimes co-sleeping (9.1%), almost always co-sleeping (5.7%) or always co-sleeping (6.1%). Compared to women who almost always or always co-slept, women who never or sometimes co-slept were more likely to choose prone sleep position, ORa = 2.10 (95% CI 1.02, 4.30) after controlling for breastfeeding at four weeks and WIC enrollment, the only identified confounders.

**Conclusions:** Co-sleeping women are more likely to follow back-to-sleep recommendations. Non-co-sleeping women may be seeking uninterrupted sleep, as prone position is associated with fewer infant awakenings.

Public Health Implications: Studies of the role of co-sleeping in SIDS risk must adjust for infant sleep position, as well as sleep surface and relationship to co-sleeper; not controlling for sleep position may diminish or mask a true risk. Similarly, studies of the risk of sleep position need to adjust for co-sleeping. Given the popularity of co-sleeping, accurate estimates of risks and benefits are needed.
Background

- Co-sleeping (bed-sharing) is common in many cultures

- Co-sleeping is controversial in the United States
  - Some believe it is a risk factor for SIDS
  - Others believe that only infants of smoking mothers are at risk
  - Co-sleeping may facilitate breastfeeding and infant-mother bonding

- Bed-sharing prevalence is rising in the United States\(^1\)
  - “Usual bed-sharing” rose from 5.5% in 1993 to 12.8% in 2000.
  - Blacks and Asians bed-share much more frequently than non-Hispanic whites.
  - Other determinants of co-sleeping are maternal age < 18, low income, living in the South, infants < 8 weeks old, and normal birthweight infants.

- Maternal smoking is a significant risk factor for SIDS, but it has not been possible to distinguish between prenatal and postnatal smoking, as these are highly correlated.

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Methods

OREGON PREGNANCY RISK ASSESSMENT MONITORING SYSTEM (PRAMS)

• Collects data on maternal attitudes and experiences prior to, during, and immediately after pregnancy for a sample of Oregon women.
• Monthly sample from birth certificates
• Analysis using first year dataset: Nov. 1998-Oct. 1999
• Mixed mode:
  o 1st mailing
  o 2nd mailing if no response
  o Computer-assisted telephone interview if no response
• Stratified, random within strata, over-sampling of first five strata to ensure adequate subgroup sample size
  o Hispanics
  o Non-Hispanic (NH) blacks
  o NH Asians & Pacific Islanders
  o NH American Indians & Alaskan Natives
  o NH whites with LBW babies
  o NH whites with NBW babies
• Weighted 1) to reflect Oregon’s population, 2) for non-response, and 3) for non-coverage
• Odds ratios determined via binary logistic regression, using SUDAAN 8.0.2
• Model building: “change-in-point-estimate” method

METHODS
OREGON PRAMS

- 2919 surveys mailed November 1998-October 1999

- 1867 surveys completed
  - 1308 – first mailing
  - 230 – second mailing
  - 329 – telephone
  - 64.0% unweighted response
  - 73.5% response weighted for strata – more appropriate measure given the complex sampling design

- 53 respondents excluded – babies were no longer alive and/or no longer living with them

- 38 respondents excluded – did not indicate whether or not their babies were alive and living with them

- 1776 eligible for analysis
61. How do you put your new baby down to sleep most of the time? Check one answer.

- On his or her side
- On his or her back
- On his or her stomach

- 44 excluded because they did not answer the sleep position question
- 1732 (97.5% of those eligible) included in the analysis
- Side-sleeping and back-sleeping combined for purposes of analysis

62. How often does your new baby sleep in the same bed with you? Check only one.

- Always
- Almost always
- Sometimes
- Never

- 1758 (99% of those eligible) answered the co-sleeping question
RESULTS
PREVALENCE OF BED-SHARING IN OREGON
(WEIGHTED PROPORTIONS)
RESULTS

PREVALENCE OF BED-SHARING BY 3RD TRIMESTER SMOKING STATUS

CROSSTABS SMOKERS VS. NONSMOKERS  p = .3835
12.9% OF THE RESPONDENTS SMOKED DURING THE THIRD TRIMESTER
RESULTS

PREVALENCE OF BED-SHARING BY CURRENT SMOKING STATUS

CROSSTABS SMOKERS VS. NONSMOKERS  \( p = .5945 \)

20.3% OF THE RESPONDENTS WERE CURRENT SMOKERS
RESULTS

DISTRIBUTION OF INFANT SLEEP POSITION BY CO-SLEEPING STATUS

<table>
<thead>
<tr>
<th>Co-sleeping (bed-sharing) status</th>
<th>Supine Sleep</th>
<th>Lateral Sleep</th>
<th>Prone Sleep</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>70.60%</td>
<td>15.94%</td>
<td>13.46%</td>
</tr>
<tr>
<td>Sometimes</td>
<td>66.28%</td>
<td>24.64%</td>
<td>9.08%</td>
</tr>
<tr>
<td>Almost Always</td>
<td>65.29%</td>
<td>29.00%</td>
<td>5.71%</td>
</tr>
<tr>
<td>Always</td>
<td>63.79%</td>
<td>30.10%</td>
<td>6.20%</td>
</tr>
</tbody>
</table>
Results

**CO-SLEEPING STATUS AND PRONE INFANT SLEEP CRUDE ODDS RATIO**

<table>
<thead>
<tr>
<th></th>
<th>n*</th>
<th>Prone Sleep †</th>
<th>Univariable OR (95% CI) ‡</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Sample</td>
<td>1763</td>
<td>9.2%</td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>330</td>
<td>13.5%</td>
<td>2.46 (1.21 – 5.02)</td>
</tr>
<tr>
<td>Sometimes</td>
<td>680</td>
<td>9.1%</td>
<td>1.58 (0.81 – 3.09)</td>
</tr>
<tr>
<td>Almost Always/Always</td>
<td>748</td>
<td>5.9%</td>
<td>Referent</td>
</tr>
</tbody>
</table>

* Unweighted number of respondents (excluding those who did not know or did not respond)
† Weighted prevalence
‡ Univariable logistic regression

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**CO-SLEEPING STATUS AND PRONE INFANT SLEEP ADJUSTED ODDS RATIO**

<table>
<thead>
<tr>
<th></th>
<th>Multivariable OR (95% CI) §</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>2.75 (1.15 – 6.54)</td>
</tr>
<tr>
<td>Sometimes</td>
<td>1.84 (0.85 – 3.96)</td>
</tr>
<tr>
<td>Almost Always/Always</td>
<td>Referent</td>
</tr>
</tbody>
</table>

§ Confounders identified by the “change-in-point-estimate method” of multivariable binary logistic regression were breastfeeding status at 4 weeks and WIC enrollment status.
Discussion

- In Oregon, women who never co-sleep are at significantly increased risk of choosing prone infant sleep position.

- Co-sleeping is as frequent among smoking mothers as among nonsmokers.

- Case series\(^3-8\) cannot resolve the controversy over co-sleeping and SIDS, without knowledge of the prevalence of co-sleeping in the population at risk.

- Not all studies on co-sleeping and SIDS have differentiated between the parental bed and other sleep surfaces (e.g. mattresses on the floor, couches, etc.) or other co-sleepers (e.g. siblings), while other studies have found these to be significant determinants of risk.\(^9\)

Discussion

- **7 major studies about SIDS and co-sleeping**
  - 1 did not adjust for current maternal smoking but found no risk for infants sleeping in beds with adults.\(^9\)
  - 1 did not report separate adjusted OR for smoking and non-smoking mothers although stating that infants of nonsmoking mothers were at lower risk.\(^10\)
  - 5 report the OR for both smokers and non-smokers
  - **Among smoking mothers:** 4 of the 5 studies found an increase in SIDS among co-sleeping infants;\(^11-15\) 1 did not.\(^15\)
  - **Among non-smoking mothers:** 0 of the 5 studies found an increase in SIDS among co-sleeping infants, except possibly very young infants.\(^14\)
- **It is generally agreed that co-sleeping is a risk factor for SIDS among smoking mothers, OR 4.5 – 17.7.**
- **If co-sleeping increases the risk of SIDS only for smoking mothers, it is unlikely that SIDS is caused by overlay asphyxiation.**

9. op. cit.
Conclusions

• Co-sleeping is very common in Oregon, as elsewhere.

• Frequent co-sleeping mothers in our study are significantly less likely to put their babies to bed on their stomachs than those who never co-sleep.

• Co-sleeping in Oregon is as common among smoking mothers as nonsmoking mothers.

Recommendations

• Greater public health efforts are needed to discourage smoking mothers from co-sleeping.

• Co-sleeping mothers should be encouraged to eliminate SIDS risks related to sleep surfaces: couches and chairs, heavy quilts or bedding, pillows near the infant, co-sleepers other than the parents.

• Additional research is needed on the motivations for co-sleeping and the risks and benefits of bed-sharing in adult beds by parents and infants, particularly regarding modifying variables (e.g. infant age, duration and frequency of co-sleeping).