


Fathers do matter





Effects of paternal parental stress and health behaviors on pregnancy outcomes in Taiwan

Presenter: Yi-Hua Chen, Ph.D

Chen CH, Huang JP, Chen PL, Chang TC, Chen YH, Chen YH
School of Public Health, Taipei Medical University, Taiwan



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Presenter Disclosures

Presenter Yi-Hua Chen

- **Disclosure**
 - All authors have no conflict of financial interest to declare

Background




Mounting evidences indicate the effects of maternal factors on the risk of adverse birth outcomes

- age, socio-demographic factors, medical history

maternal factors → **pregnancy outcomes**


The important role of paternal characteristics has drawn increasing attention (Chen et al., 2008; Magnus et al., 2001; Nahum & Stanislaw, 2003)

- paternal age, height, and birth weight



Paternal Effects (1)

- Age: younger paternal age might increase the risk of low birthweight and preterm birth (Abel et al. 2009; Chen et al., 2008), irrespective of other maternal or pregnancy-specific factors
 - while advanced paternal age was associated with congenital anomalies and spontaneous abortion (Yang et al., 2006; Slama et al., 2005)
- Education
 - higher risks of low birthweight (Parker and Schoendorf, 1992) and preterm term birth (Abel et al., 2009) were found to associate with lower paternal education, compared with fathers with a college education
 - paternal education levels were inversely related to infant mortality in preterm and full-term infants (Ko et al. 2014)



Paternal Effects (2)

- Paternal lifestyle factors and obesity may act as risk factors for the development of hypertensive complications in their pregnant partner (Dekker et al., 2011)
 - impact on pregnancy outcomes
- Lack of paternal involvement was associated with higher rates of preterm birth, small-for-gestational age, and infant morbidity and mortality (Salihu et al. 2013)
- In a systematic review, the authors concluded that
 - further studies are needed to examine the influence of paternal factors on preterm birth and small-for-gestational-age birth (Shah, 2010)



Gap in previous studies

- Although the significance of paternal roles has been highlighted
 - most studies relied on the mother as a proxy reporter
 - only a limited and rather narrow examination (e.g., age, anthropometry, birth weight, education) was performed to investigate paternal effects on pregnancy outcome
 - little attention was placed on psychosocial domains



Study Aims

- Our study was thus aimed to investigate
 - the effects of paternal parental stress and lifestyle (health behaviors) on pregnancy outcomes
 - with simultaneous consideration on maternal emotional status

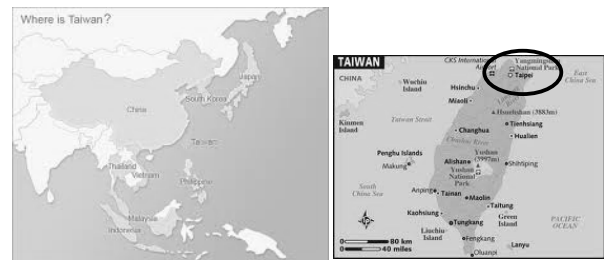


Methods



Time and Place

- Time: since July, 2011
- Place: 5 selected hospitals in Taipei, Taiwan



Sample

- Inclusion criteria
 - undergo a first-trimester prenatal visit in the Department of Obstetrics and Gynecology
 - plan to carry the baby till term
 - whose spouse is also willing to participate
- Exclusion criteria
 - unable to read and write Chinese questionnaires
 - severe psychiatric illnesses
- Written informed consent was obtained before interview started
- Institutional Review Board approval was obtained



Data Collection Process

- Interviewers are trained for standardization
- Outpatient center
- Contact women when they are undergoing their first prenatal visits, together with their couples
- Explain the study and obtain informed consent
- Begin answering questionnaires (returned questionnaires are checked for missing and inappropriate responses)
- Follow-up can be done during the next visits or postal mails (one month after childbirth)



Instrument I

- Pregnancy outcome
 - (1) preterm delivery
 - ≥ 37 gestational week
 - < 37 gestational week
 - (2) low birth weight
 - ≥ 2500 gram
 - < 2500 gram

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Instrument II

- Self-reported questionnaires
 - Parental Stress Scale
 - 18 questions
 - the higher the score, the higher the parental stress
 - Good internal consistency reliability (Cronbach's $\alpha=0.83$) and test-retest reliability (0.81) (Berry and Jones 1995)
 - Chinese version: good reliability for both mothers (Cronbach's $\alpha=0.83$) and fathers (Cronbach's $\alpha=0.85$)
 - Lifestyle (health behavior) : physical activity, nutrition, vitamins, prescription, smoking, and alcohol consumption
 - the higher the score, the worse the lifestyle (health behaviors)
 - appropriate vs. inappropriate (Q_3 as a cut-off point)

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Instrument III

- Self-reported questionnaires
 - Edinburgh Postnatal Depression Scale , EPDS
 - 10 questions
 - Total: 30, the higher the score, the higher the depression
 - Chinese version: Cronbach's $\alpha=0.87$ (Heh,2001)
 - Locke-Wallace marital adjustment test
 - 15 questions
 - the higher the score, the worse the adjustment
 - Cronbach's $\alpha = .9$ (Locke, H. et al,1959)

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Instrument IV: Other covariates

- Sociodemographic Data
 - maternal and paternal age, education, marital status, occupation, religion, and household monthly income
- Pregnancy history of preterm delivery, low birth weight, miscarriage, abortions, unplanned pregnancy, previous infertility, and parity
- Previous and current obstetrical problems, gestational diabetes, hypertension, and congenital anomalies, infant gender, birth outcomes
- Medical History
 - current medical conditions and psychiatric history

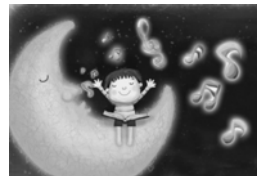
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Statistical analysis

- Bivariate analysis
 - Categorical variables: chi-square test
 - Continuous variables: t-test, one-way ANOVA
- Logistic regression models
- Using STATA 11.0
- $\alpha < 0.05$ for statistical significance

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Results

Table 1: Distribution of maternal and paternal traits (n=618)

| | Mothers | | Fathers | |
|---------------------------------|---------|------|---------|------|
| | mean | SD | mean | SD |
| Age (yr) | 32.02 | 3.61 | 33.92 | 4.53 |
| | n | % | n | % |
| Marital status | | | | |
| Married | 583 | 95.9 | 594 | 96.1 |
| Single and not living with mate | 7 | 1.1 | 6 | 1.0 |
| Single but living with mate | 18 | 3.1 | 18 | 2.9 |
| Education level | | | | |
| Junior school and below | 5 | 0.8 | 7 | 1.2 |
| High school | 56 | 9.1 | 68 | 11.0 |
| College | 447 | 72.3 | 347 | 56.2 |
| Master or above | 110 | 17.8 | 195 | 31.6 |

Table 1: Distribution of maternal and paternal traits (n=618) (cont.)

| | Mothers | | Fathers | |
|-----------------------------|---------|------|---------|------|
| | n | % | n | % |
| Occupation | | | | |
| Medicine | 50 | 8.1 | 32 | 5.2 |
| Soldier/Government employee | 67 | 10.8 | 76 | 12.3 |
| Industry/business | 197 | 31.8 | 273 | 44.2 |
| Housekeeper/Freelance | 86 | 13.9 | 17 | 2.8 |
| Services | 138 | 22.3 | 158 | 25.6 |
| Unemployed/Student | 43 | 6.9 | 17 | 2.8 |
| Other | 38 | 6.2 | 44 | 7.1 |
| Religion | | | | |
| No/Other | 249 | 40.3 | 268 | 43.3 |
| Buddhism/Taoism | 308 | 49.8 | 324 | 52.4 |
| Yiguandao | 10 | 1.6 | 9 | 1.4 |
| Christianity/Catholic | 51 | 8.3 | 18 | 2.9 |

Table 1: Distribution of maternal and paternal traits (n=618) (cont.)

| | Mothers | | Fathers | |
|--------------------|---------|------|---------|------|
| | n | % | n | % |
| Monthly Income | | | | |
| Less than \$30,000 | 16 | 2.6 | 11 | 1.7 |
| 30,000-60,000 | 113 | 18.3 | 111 | 17.9 |
| 60,000-100,000 | 292 | 47.2 | 290 | 46.9 |
| 100,000-200,000 | 154 | 24.9 | 157 | 25.4 |
| 200,000 or above | 43 | 7.0 | 50 | 8.1 |

Note: 1 USD=30 NT dollars

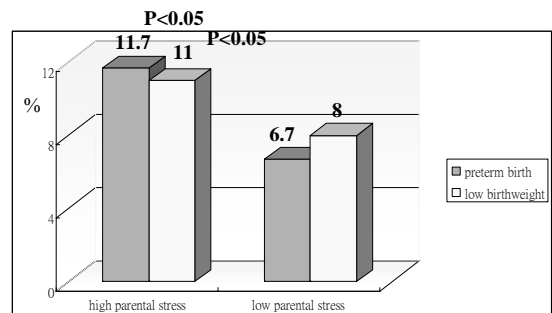
Table 2: Distribution of Pregnancy Outcomes (n=618)

| Pregnancy outcome | number | percentage |
|--------------------------|--------|----------------|
| Preterm birth | | |
| ≥ 37 gestational week | 571 | 92.4 |
| <37 gestational week | 47 | 7.6 |
| gestation age, mean (SD) | | 38.6 (1.9) |
| Low birthweight | | |
| ≥2500g | 564 | 91.3 |
| <2500g | 54 | 8.7 |
| birth weight, mean (SD) | | 3128.6 (436.1) |

Table 3: Distribution of Paternal parenting stress and parental health behaviors (n=618)

| Variables | number | percentage |
|--------------------------|--------|------------|
| Paternal parental stress | | |
| High | 154 | 24.9 |
| Low | 464 | 75.1 |
| Paternal life style | | |
| Inappropriate | 153 | 24.8 |
| Appropriate | 465 | 75.2 |

Figure 1: the distribution of pregnancy outcomes on paternal parental stress (n=618)



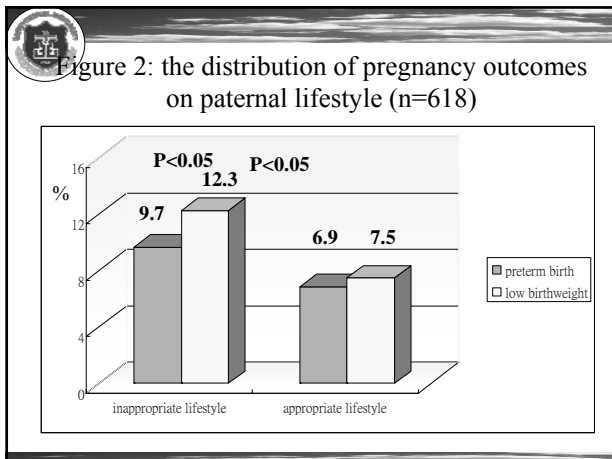


Table 4: Effects of paternal traits on pregnancy outcomes (n=618)

| variable | Crude OR (p-value) | Adjusted OR (p-value) ^a |
|------------------------------------|--------------------|------------------------------------|
| Paternal parental stress | 1.0 | 1.0 |
| High (ref. "low") | 1.8* (0.04) | 1.6* (0.04) |
| Paternal lifestyle | | |
| Inappropriate (ref. "appropriate") | 1.5* (0.03) | 1.1 (0.12) |

^aAdjusted for maternal demographics (education, family income, urbanization level, parity, lifestyle, pregnancy history, and previous and current obstetrical problems), medical history (hyperlipidemia, thyroid dysfunction, urinary tract infections, deficiency anemia, and depression), infant gender, marital adjustment.

Table 5: Effects of paternal traits on pregnancy outcomes by maternal prenatal depression status (n=618)

| Variables | Crude OR (p-value) | Adjusted OR (p-value) ^a |
|-----------------------------------|--------------------|------------------------------------|
| Higher maternal depression | | |
| Paternal high stress (ref. "low") | 1.9* (0.03) | 1.5* (0.04) |
| Lower maternal depression | | |
| Paternal high stress (ref. "low") | 1.2 (0.32) | 1.1 (0.83) |

^aAdjusted for maternal demographics (education, family income, urbanization level, parity, lifestyle, pregnancy history, and previous and current obstetrical problems), medical history (hyperlipidemia, thyroid dysfunction, urinary tract infections, deficiency anemia, and depression), infant gender, marital adjustment.



Summary

- Paternal parental stress was significantly associated with pregnancy outcomes of preterm birth and low birthweight
 - especially among those with high maternal depression during pregnancy
 - extend from previous findings on effect of paternal traits (e.g., age, education) on pregnancy outcomes (Abel et al. 2009; Chen et al., 2008; Yang et al., 2006; Slama et al., 2005; Parker and Schoendorf, 1992; Ko et al. 2014)

Paternal factors

- Paternal lifestyle factors and obesity may act as risk factors for the development of hypertensive complications in their pregnant partner (Dekker et al., 2011)
 - impact on pregnancy outcomes



Limitation

- Selection bias
 - Healthier women/couple
- Social desirability bias
 - the tendency of respondents to answer questions in a manner that will be viewed favorably by others (self-reported data)



Conclusion

- Our study highlights the need to consider significant influences:
 - paternal psychosocial factor (parental stress)
 - paternal lifestyle or health behaviors to link with maternal effects
 - may bring to bear on the pregnancy and ultimately birth outcomes in the community prenatal care program



Acknowledge---Project Team

(alphabetical order)

Au, Heng-Kien, MD
 Department of obstetrics and gynecology, Taipei Medical University Hospital

Lee, Hsin-Chien, MD
 School of Psychiatry, Taipei Medical University, Shang Ho Hospital

Lee, Szu-Hsien, PhD
 Department of Health Promotion and Health Education, National Taiwan Normal University

Lin, Chen-Li, MD, PhD
 Department of obstetrics and gynecology, Taipei City Hospital

Huang, Jian-Pei, MD
 Department of obstetrics and gynecology, Mackay Memorial Hospital

Huang, Min-Chao, MD
 Department of obstetrics and gynecology, Mackay Memorial Hospital



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