View metadata, citation and similar papers at core.ac.uk
brought to you by CORE
provided by Elsevier - Publisher Connector

Maternal Demographic and Psychosocial Factors Associated with Low Birth Weight in Eastern Taiwan

Yin-Ming Li and Tzu-Kuei Chang[1]
Department of Family Medicine, Buddhist Tzu-Chi General Hospital, and
[1]Department of Public Health, Tzu Chi University, Hualien City, Taiwan.

The relationship between birth weight and maternal sociodemographic characteristics was examined in a sample from two teaching hospitals in eastern Taiwan. Using a structured questionnaire, we conducted face-to-face interviews with women at antenatal clinics between 1998 and 1999 in Hualien City. One year later, we took the outcome of pregnancy from medical records and birth certificates from the Public Health Bureau of Hualien County. Of the 1,128 single live births, 6.8% had low birth weight (LBW) using the World Health Organization cut-off of 2,500 g. LBW was more common in teenage (< 20 years), older (> 30 years), first-time, and unmarried mothers; those with basic/intermediate educational attainment; and residents of aboriginal districts. Teenage pregnancies were more likely than those in adults to be unplanned, and such mothers had smoking or alcohol-drinking behavior. Prevention of teenage pregnancy is crucial to lower LBW rates in eastern Taiwan. For adult mothers, basic or intermediate educational attainment, residence in an aboriginal district, and first-term pregnancy were significant factors associated with LBW, after adjustment for other psychosocial attributes, such as psychologic distress and poor family support. Thus, we should pay more attention when caring for pregnant women with such sociodemographic characteristics, and ensure that they have adequate prenatal care and can adopt a healthy lifestyle.

Key Words: eastern Taiwan, low birth weight, maternal, demographic, psychosocial factors
(*Kaohsiung J Med Sci* 2005;21:502–10)

Infants weighing less than 2,500 g at birth are considered to be of low birth weight (LBW) [1]. The association between LBW and a greatly elevated risk of infant mortality [2,3], and other physical and neurologic impairment [4], is well established. LBW also stresses the family and healthcare financial systems [5]. Thus, the prevention of LBW is a major public health priority.

Risk factors for LBW are many and varied [6–14]. Demographic risk factors include young maternal age [6–8,11], primiparity [7,9,12], and race [9]. Lower education [10,11], smoking [10], and psychologic influences are also strongly associated with LBW [13,14]. In Taiwan, Chen et al found that antepartum hemorrhage and hypertension were the strongest risk factors for LBW infants [15,16]. Low parental education is a significant parental factor associated with LBW infants. Fu et al found that, after controlling for socioeconomic variables, teenage pregnancies were at significantly higher risk for LBW [17]. Other maternal characteristics such as older maternal age, short stature, low income, multiple pregnancies, or no domestic helper were also associated with higher risk for LBW [18]. A study among first-time mothers in southern Taiwan revealed that risk factors for LBW among teenage and adult mothers were different [19]. Significant risk factors for LBW among adolescent

Received: April 29, 2005 Accepted: August 23, 2005
Address correspondence and reprint requests to: Dr. Yin-Ming Li, Department of Family Medicine, Buddhist Tzu-Chi General Hospital, 707 Chung Yang Road, Section 3, Hualien 970, Taiwan.
Email: yinming@mail.tcu.edu.tw

© 2005 Elsevier. All rights reserved.

mothers were low gestational weight gain (< 10 kg) and low pregravid weight (< 45 kg), and among adult mothers was infrequent prenatal visits (< 10). In summary, most previous studies of LBW have focused on one category of risk factor, such as maternal age, medical problems, or sociodemographic factors [15–19]. A comprehensive assessment of risk factors before pregnancy is needed for primary prevention of LBW. Furthermore, few studies have been conducted since the implementation of the National Health Insurance Services program in 1994. Since then, 10 antenatal checks for each pregnant woman are provided free of charge. Few studies of risk factors associated with LBW have been conducted in eastern Taiwan, where newborn and infant mortality are the highest nationally [20].

In this hospital-based cohort study, we examined the risk factors for LBW, especially with regard to variables related to demographic features, lifestyle behavior, psychologic distress, and family function. This is the first study assessing multiple maternal risk factors in eastern Taiwan. Our results may suggest a strategy for reducing the incidence of LBW.

Subjects and Methods

This was a cohort and two-step study. Step one was conducted between November 1998 and June 1999. Pregnant women enrolled at prenatal clinics at two teaching hospitals in Hualien City were interviewed. Informed consent was obtained from subjects prior to participation. Questionnaires were administered in face-to-face interviews conducted in private by public health students or by attending nurses in obstetric wards. Interviewers received training before data collection. All interviewers were trained to a standard ability before the interviews.

Questions were on demographic variables, lifestyle behaviors, medical history, psychologic distress, and family function. Demographic characteristics that were examined included maternal age at pregnancy, educational attainment, ethnicity, place of residence (aboriginal vs non-aboriginal), and marital status. History of spontaneous abortion; anemia; lung, liver or gastric problems; and smoking and alcohol drinking behavior were also assessed.

Psychologic distress was measured in terms of depressive mood, using the Center for Epidemiologic Studies Short Depression Scale (CES-D 10) [21]. Subjects indicated how often they felt the item during the past week: "rarely or none of the time," "some or a little of the time," "occasionally or a moderate amount of time," and "all of the time," scored 0, 1, 2, or 3, respectively. If more than two items were missing, the scale was deleted. The score was the sum of the 10 items and ranged from 0 to 30. A score of 10 or more was considered depression. The CES-D Chinese version has been tested and may be used to identify psychiatric morbidity in Chinese elderly [22]. In our study, there were 1,022 valid scales. The internal reliability (Cronbach's α) was 0.76.

The family Adaptation, Partnership, Growth, Affection, and Resolve (APGAR) is a reliable and validated instrument for measuring a subject's satisfaction with five components of family function [14]. Each question is scored 2, 1, or 0, depending on whether the answer is "almost always," "some of the time," or "hardly ever." The scale score ranges from 0 to 10. Scores of 7–10 correlate with normal function, 4–6 with moderate dysfunction, and 0–3 with severe family dysfunction. In our study, 1,084 subjects answered the family APGAR scale. Cronbach's α was 0.80.

In step two, delivery data for each participant were collected from medical records and rechecked against birth certificates from the Public Health Bureau of Hualien County, 1 year after step one. Information included newborn sex, birth weight, height, number of infants, and gestational age. In this study, only live singleton births and gestational ages of 25 weeks or more were included. LBW was defined as weight less than 2,500 g at birth [1]. Subjects who gave birth to LBW infants were defined as LBW mothers, and those who had infants weighing 2,500 g or more at birth were defined as the normal birth weight (NBW) mothers.

Statistical analysis

Subjects were grouped by age: teenage (< 20 years), young adults (20–30 years), and older adults (> 30 years). Educational attainment was stratified as basic (formal education < 10 years), intermediate (10–12 years), and high (college/university). Differences in the distribution of maternal characteristics between LBW and NBW infants were examined by cross tabulation using Chi-squared analysis. Odds ratios (ORs) and 95% confidence intervals (CIs) were calculated for associations of various maternal characteristics with LWB. Multiple logistic regression analyses were calculated to estimate the relative risk (RR) of LBW among adult women, adjusted for other significant associated factors. Statistical analyses were performed using SAS/PC+, version 8.12 (SAS Corporation, Cary, NC, USA). A p value of less than 0.05 was considered statistically significant.

Results

Characteristics of live single births

A total of 1,357 women were enrolled between November 1998 and June 1999. After excluding loss to follow-up (167), multiple delivery (11), stillbirth (5), and subjects with incomplete data (45), 1,128 live births were included to assess the maternal risk factors for LBW. Mean birth weight was 3,200 ± 490 g. The rate of LBW was 6.8%. Mean weight for LBW (n = 77) and NBW (n = 1,051) infants was 2,100 ± 600 g and 3,200 ± 400 g, respectively. Mean maternal age was 27.2 years and the mean parity before index pregnancy was 1.0 (range, 0–6). There were 86 teenage mothers (7.6%) and 282 (25.0%) older adult mothers. Four hundred and one subjects (35.6%) were nulliparous and 8.6% of these had LBW infants.

Maternal demographic characteristics

Maternal demographic characteristics are shown in Table 1. About 25% of mothers who responded were aborigines and 13.7% who responded were living in aboriginal districts. The majority (82%) of mothers had intermediate or high education. Of 693 responses, 24.3% reported a history of spontaneous abortion. The prevalence of smoking among those who responded was 11.6%, and 11.0% reported

Table 1. Maternal demographic characteristics (n = 1,128)

Characteristic	n	Characteristic	n
Maternal age (yrs)		Spontaneous abortion history	
< 20	86 (7.6%)	Yes	168 (24.3%)
20–30	760 (69.7%)	No	525 (75.7%)
> 30	282 (25.0%)	Missing	435
Ethnicity		Birth order	
Taiwanese	466 (42.6%)	First birth	401 (35.6%)
Hakka	206 (18.8%)	Other	727 (64.4%)
Other	150 (13.7%)		
Aborigine	272 (24.9%)	Intended pregnancy	
Missing	34	Yes	796 (72.6%)
		No	301 (27.4%)
Educational attainment		Missing	31
Basic	199 (18.1%)		
Intermediate	553 (50.3%)	Smoking	
Higher	348 (31.7%)	No	902 (88.7%)
Missing	28	Occasional	76 (7.5%)
		Often	42 (4.1%)
Residency		Missing	108
Aboriginal	130 (13.7%)		
Non-aboriginal	820 (86.3%)	Alcohol drinking	
Missing	178	No	818 (87.9%)
		Occasional	102 (11.0%)
Occupation		Often	11 (1.2%)
Blue collar	33 (3.0%)	Missing	197
White collar	386 (35.5%)		
Government or school	126 (11.6%)	Marital status	
Housewife	346 (31.8%)	Married	1,012 (91.0%)
Student	5 (0.5%)	Cohabiting	40 (3.6%)
No job	191 (17.6%)	Unmarried	33 (3.0%)
Missing	41	Re-married	10 (0.9%)
		Not going to get married	6 (0.6%)
Medical illness*		Missing	27
Yes	248 (23.9%)		
No	791 (76.1%)		
Missing	89		

*Anemia, lung disease, liver disease, gastrointestinal problems.

"occasional" and 1.2% reported "often" for alcohol drinking. The mean score of CES-D was significantly higher in LBW mothers (11.0 vs 9.0) and 57.1% of LBW mothers screened positive (CES-D > 10) for depressive mood. About 10.4% of mothers had moderate or severe family dysfunction (APGAR < 7), but this was not significantly different between the groups (data not shown).

Table 2 shows the difference in LBW rate by maternal age group, ranging from 5.4% in young mothers through 9.6% in older mothers to 10.5% in teenage mothers. The rate of LBW in teenage and older mothers was almost twice that in young mothers. Teenage mothers had the highest risk of having an LBW infant (OR 2.05, 95% CI 0.96–4.38), but this association did not reach statistical significance. Older mothers had a significantly higher relative risk of having an LBW infant (OR 1.86, 95% CI 1.12–3.08).

Univariate analysis

Covariate unadjusted analysis revealed that unmarried mothers and those with lower education (basic or intermediate) were three times more likely to have an LBW infant (Table 2). Mothers who were teenaged, older adults, or living in an aboriginal district were more likely to have LBW infants. Mothers who consumed tobacco (OR 2.00; 95% CI 1.10–3.71) or alcohol (OR 2.25; 95% CI 1.22–4.16) and first-time mothers (OR 1.66; 95% CI 1.04–2.67) were also likely to have LBW infants. There was also a higher risk of a LBW infant in mothers with unintended pregnancy, pre-gestational medical illness, psychologic distress, or moderate/severe family dysfunction, but this difference was not statistically significant.

Of the 86 teenage mothers (aged 15–19), 56 (66.0%) were aborigines and 42% were living in an aboriginal district. Two-thirds had low educational attainment (≤ 9 years' schooling). About one-third (32.1%) of teenage mothers were not married or had an unintended pregnancy, and only 13 (15%) worked. Smoking (29%) and alcohol drinking (22%) behaviors were more common among teenage mothers than adult mothers (smoking 9.9%, alcohol drinking 10.9%). Psychologic distress was found in 46.8% of teenage mothers. About one-fifth (17.4%) had moderate or severe family dysfunction. Most demographic characteristics were significantly different between teenage and adult mothers (data not shown).

Multivariate analysis

First, we performed multivariate analysis of risk factors for LBW with control for the sex of the infant and maternal age. Being a first-time mother (OR 2.12, 95% CI 1.10–4.06) and having intermediate or basic educational attainment (OR 3.57, 95% CI 1.40–9.14) were significant risk factors for LBW. Teenage mothers were at lower risk of having LBW infants (OR 0.45, 95% CI 0.12–1.17) (data not shown). The proportion of adolescent mothers was only 7.6%, and these gave birth to 9.1% of LBW infants in our study, so the analysis of multiple risk factors among teenage mothers seemed unwarranted. Furthermore, demographic characteristics were significantly different between teenage and adult mothers. In a repeated multiple logistic regression analysis, we excluded teenage mothers (Table 3). Maternal age, aboriginal race, unmarried status, smoking and alcohol consumption, psychiatric distress, and moderate or severe family dysfunction had no significant effect after adjustment. For the 620 adult mothers, basic/intermediate educational attainment (OR 3.62, 95% CI 1.40–9.36), living in an aboriginal district (OR 2.90, 95% CI 1.18–7.11), and being a first-time mother (OR 2.74, 95% CI 1.36–5.52) remained significant risk factors associated with LBW.

Discussion

In our study, the LBW rate was 6.8% (7.3% for girls and 6.4% for boys). The LBW rate was high but was comparable to a previous report (7.4% in 1997–1999) [23]. Female infant and first birth were factors associated with LBW, which is consistent with the results of previous studies [15, 24], indicating that female infant and first birth were risks for LBW.

Univariate analysis showed that teenage and older adult mothers were at higher risk of delivering an LBW infant than young adult mothers. This finding was similar to previous studies [17,19,23–25]. Fraser et al found that younger age conferred an increased risk of adverse pregnancy outcome that was independent of important confounding sociodemographic factors [6]. It is unclear whether biologic or social inadequacies best explain LBW in this population.

In our study, teenage mothers were more likely to be aboriginal than adult mothers, and had more smoking and alcohol-drinking behaviors. With a higher prevalence of family dysfunction and unplanned pregnancies [14], less education, and a lack of access to resources, teenage mothers have more risk factors for an LBW infant. The impact of sociodemographic factors on LBW need further study in a large sample of teenage subjects.

LBW rates also vary among mothers of different ethnic origin and residency [25]. Aboriginal mothers or mothers who lived in aboriginal districts were twice as likely to give

Table 2. Univariate analysis of factors associated with low birth weight

	Birth weight, *n*		Relative risk	
Variable	≥ 2,500 g	< 2,500 g	OR	95% CI
Sex				
Female	469	37 (7.3%)	1.14	0.75, 1.75
Male	572	40 (6.4%)	1	
Birth order				
First birth	365	36 (9.0%)	1.66	1.04, 2.63
Other	686	41 (5.6%)	1	
Intended pregnancy				
No	280	21 (7.0%)	1.00	0.60, 1.67
Yes	740	56 (7.0%)	1	
Maternal age (yrs)				
< 20	77	9 (10.5%)	2.05	0.96, 4.38
> 30	255	27 (9.6%)	1.86	1.12, 3.08
20–30	719	41 (5.4%)	1	
Ethnicity				
Aborigine	246	26 (9.6%)	1.70	1.04, 2.81
Non-aborigine	774	48 (5.8%)	1	
Educational attainment				
Basic/intermediate	687	65 (8.6%)	2.90	1.51, 5.56
Higher	337	11 (3.2%)	1	
Residency				
Aboriginal	114	16 (12.3%)	2.31	1.27, 4.20
Non-aboriginal	773	47 (5.7%)	1	
Job				
No	493	49 (9.0%)	1.91	1.17, 3.10
Yes	518	27 (5.0%)	1	
Marital status				
Unmarried	73	16 (18.0%)	3.41	1.88, 6.22
Married	951	61 (6.0%)	1	
Smoking				
Yes	104	14 (11.9%)	2.00	1.10, 3.71
No	845	57 (6.3%)	1	
Alcohol drinking				
Yes	98	15 (13.3%)	2.25	1.22, 4.16
No	766	52 (6.4%)	1	
Medical illness*				
Yes	341	28 (7.5%)	1.12	0.69, 1.83
No	622	45 (6.8%)	1	
Psychiatric distress				
Yes	463	40 (8.0%)	1.41	0.86, 2.30
No	489	30 (5.8%)	1	
Family function				
Moderate or severe	305	26 (7.9%)	1.28	0.88, 2.1
Normal function	704	47 (6.3%)	1	

*Anemia, lung disease, liver disease, gastrointestinal problems.
OR = odds ratio; CI = confidence interval.

Table 3. Factors associated with low birth weight in adult mothers

	Birth weight		Univariate analysis	Multivariate analysis*
Variable	≥ 2,500 g	< 2,500 g	OR (95% CI)	OR (95% CI)
Sex				
Female	440	31 (6.6%)	1.02 (0.62, 1.66)	1.23 (0.64, 2.36)
Male	534	37 (6.5%)	1	
Birth order				
First birth	339	32 (8.6%)	1.67 (1.02, 2.73)	2.74 (1.36, 5.52)
Other	635	36 (5.4%)	1	
Intended pregnancy				
No	257	18 (6.6%)	1.00 (0.55, 1.68)	
Yes	688	50 (6.8%)	1	
Maternal age (yrs)				
> 30	255	27 (9.6%)	1.86 (1.12, 3.08)	1.92 (0.91, 4.04)
20–30	719	41 (5.4%)	1	
Ethnicity				
Aborigine	195	21 (9.7%)	1.79 (1.04, 3.08)	1.18 (0.50, 2.77)
Non-aborigine	748	45 (5.7%)	1	
Educational attainment				
Basic/intermediate	612	56 (8.4%)	2.80 (1.45, 5.42)	3.62 (1.40, 9.36)
Higher	337	11 (3.2%)	1	
Residency				
Aboriginal	83	14 (14.4%)	3.02 (1.58, 5.76)	2.90 (1.18, 7.11)
Non-aboriginal	733	41 (5.3%)	1	
Job				
No	428	42 (8.9%)	1.99 (1.19, 3.32)	1.12 (0.56, 2.23)
Yes	507	25 (4.7%)	1	
Marital status				
Unmarried	53	10 (15.9%)	2.94 (1.42, 6.05)	1.63 (0.61, 4.42)
Married	899	58 (6.1%)	1	
Smoking				
Yes	80	13 (14.0%)	2.59 (1.35, 4.98)	0.97 (0.33, 2.89)
No	798	50 (5.9%)	1	
Alcohol drinking				
Yes	82	12 (12.7%)	2.16 (1.10, 4.22)	1.16 (0.39, 3.39)
No	722	49 (6.4%)	1	
Medical illness†				
Yes	314	25 (7.4%)	1.18 (0.70, 1.99)	
No	580	39 (6.3%)	1	
Psychiatric distress				
Yes	432	35 (7.5%)	1.35 (0.81, 2.27)	1.40 (0.72, 2.74)
No	451	27 (5.7%)	1	
Family dysfunction				
Moderate or severe	272	23 (7.8%)	1.34 (0.79, 2.27)	1.38 (0.69, 2.76)
Normal function	665	42 (5.9%)	1	

*n = 620, of whom 43 had low birth weight infants; df = 12, degree of freedom; likelihood ratio Chi-squared = 30.05; p = 0.0027; †anemia, lung disease, liver disease, and gastrointestinal problems. OR = odds ratio; CI = confidence interval.

birth to LBW infants. The disparity may have to do with differences in culture, diet, stress, lifestyle or socioeconomic disadvantages, or comparatively low use of prenatal care. Further investigation of this disparity is needed.

Marital status is also a key correlate of LBW. In our study, the rate of LBW infants among unmarried mothers was three times higher than among married mothers. Socioeconomic status is dependent on income, occupation and education. Education may also have independent effects because more highly educated mothers may know more about family planning and healthy behaviors during pregnancy [17,18]. For adult mothers, basic or intermediate education or living in an aboriginal district was associated with a significantly higher risk of LBW, after adjusting for other psychosocial attributes, such as depressive mood and family dysfunction. Thus, educational attainment could be used as a predicator of pregnancy outcome. This implies that intensive prenatal care for women with low education may be most crucial in preventing LBW incidence.

Smoking tobacco and drinking alcohol during pregnancy are well known to be associated with adverse effects. However, multivariate analysis showed no significant effect on LBW, presumably because only a few mothers smoked heavily or drank alcohol frequently. Our findings are similar to those of Chen et al in Taipei [15]. Since smoking and alcohol drinking during pregnancy are major factors associated with LBW in Western countries, healthy lifestyles should be emphasized during antenatal medical care to prevent adverse effects to the fetus.

LBW continues to be a significant public health problem in Taiwan: mean birth weight decreased by 3.2% (105 g) between 1982 and 1997, and the LBW rate increased by 33.3% [26]. The newborn or infant mortality and teenage pregnancy rates are highest in eastern Taiwan [27]. In our study, the LBW rate among singleton pregnancies was significantly higher than the rate in Taiwan as a whole [24]. Therefore, prevention of teenage pregnancy is crucial in preventing LBW infants in eastern Taiwan.

This study design has the advantage that the prevalence of common risk factors can be estimated. Maternal demographic characteristics, psychologic factors, and family function were comprehensively assessed. However, there were some limitations and biases in the study. The reasons for lack of participation of subjects were not recorded. The amounts for smoking and drinking were self-reported, so bias might have occurred. Pregnant women may conceal such behaviors and bias might have occurred through different gestational period assessment. In addition, a large proportion of mothers did not respond to the spontaneous abortion question. It may, however, be difficult to obtain reliable information on these issues during a short registration visit at the antenatal care clinic.

In our study, multiple risk factors for LBW have been addressed for the first time in eastern Taiwan. Since deliveries at the two hospitals consisted of an estimated 70% of infants born in Haulien County, we believe our results have important implications. Improvement of knowledge about the specific maternal characteristics that relate to LBW may allow better identification or care of women who are at risk.

In conclusion, young or older age pregnancy, basic or intermediate educational attainment, and living in an aboriginal district were common maternal demographic factors of LBW, confirming the results of other studies [16,17,19,20,23,25]. Prevention of teenage pregnancy and efforts to improve the prenatal care of women with intermediate education may reduce the risk of LBW. Our results also support the notion that every effort should be made to persuade pregnant women to adopt a healthy lifestyle.

Acknowledgment

This study was supported by a grant from the ROC Department of Health, DOH 88-TD-1025.

References

1. United Nations Children's Fund and World Health Organization. *Low Birth Weight: Country, Regional and Global Estimates*. New York: UNICEF, 2004:5.
2. Joseph KS, Kramer MS. Recent trends in infant mortality rates and proportions of low-birth-weight live births in Canada. *Can Med Assoc J* 1997;157:535–41.
3. Samuelsen SO, Magnus P, Bakketeig LS. Birth weight and mortality in childhood in Norway. *Am J Epidemiol* 1998;148: 983–91.
4. Whitaker AH, Van Rossem R, Feldman JF, et al. Psychiatric outcomes in low-birth-weight children at age 6 years: relation to neonatal cranial ultrasound abnormalities. *Arch Gen Psychiatry* 1997;54:847–56.
5. Rogowski J. Cost-effectiveness of care for very low birth weight infants. *Pediatrics* 1998;102:35–43.
6. Fraser AM, Brockert JE, Ward RH. Association of young maternal age with adverse reproductive outcomes. *New Engl J Med* 1995;332:1113–7.
7. Wessel H, Cnattingius S, Bergstrom S, et al. Maternal risk factors for preterm birth and low birth weight in Cape Verde. *Acta Obstet Gynecol Scand* 1996;75:360–6.

8. Lee KS, Ferguson RM, Corpuz M, Gartner LM. Maternal age and incidence of low birth weight at term: a population study. *Am J Obstet Gynecol* 1988;158:84–9.
9. Abrams B, Newman V. Small-for-gestational-age birth: maternal predictors and comparison with risk factors of spontaneous preterm delivery in the same cohort. *Am J Obstet Gynecol* 1991;164:785–90.
10. Satin AJ, Keveno KJ, Sherman L, et al. Maternal youth and pregnancy outcomes: middle school versus high school age groups compared with women beyond the teen years. *Am J Obstet Gynecol* 1994;171:184–7.
11. Karim E, Mascue-Taykir CGN. The association between birth weight, sociodemographic variables and maternal anthropometry in an urban sample from Dhaka, Bangladesh. *Ann Hum Biol* 1997;24:387–401.
12. Arif MA, Qureshi AH, Jafarey SN, et al. Maternal sociocultural status: a novel assessment of risk for the birth of small for gestational age, low birth weight infants. *J Obstet Gynaecol Res* 1998;24:215–22.
13. Pagel MD, Smilkstein G, Regen H, Montano D. Psychosocial influences on new born outcomes: a controlled prospective study. *Soc Sci Med* 1990;30:597–604.
14. Smilkstein G, Helsper-Lucas A, Ashworth C, et al. Prediction of pregnancy complications: an application of the biopsychosocial model. *Soc Sci Med* 1984;18:315–21.
15. Chen PC, Doyle PE, Ho CK, et al. Influence of maternal risk factors on low birth weight, preterm delivery, and small for gestational age — a prospective cohort study of pregnancy. *Chin J Public Health (Taipei)* 2000;19:192–202.
16. Chen PC, Doyle PE, Lai L, Wang JD. Parental socioeconomic status and low birth weight, preterm delivery, and small for gestational age in Taiwan. *Chin J Public Health (Taipei)* 1999;18: 105–15.
17. Fu CY, Lu JH, Wu HM, et al. Increased risk for low birth weight and preterm birth in teenage pregnancy. *Chin J Public Health (Taipei)* 1999;18:228–34. (In Chinese)
18. Ko YL, Wu YC, Chang PC. Physical and social predictors for pre-term births and low birth weight infants in Taiwan. *J Nurs Res* 2002;10:83–9.
19. Wang CS, Chou P. Risk factors for low birth weight among first-time mothers in southern Taiwan. *J Formos Med Assoc* 2001;100:168–72.
20. Department of Health, Executive Yuan, R.O.C. *Infant and Maternal Mortality, 2003*. Available at: http://www.doh.gov.tw/statistic/data. (In Chinese)
21. Radloff LS. The CES-D scale: a self-report depression scale for research in the general population. *Appl Psychol Meas* 1977;1: 385–401.
22. Boey KW. Cross-validation of a short form of the CES-D in Chinese elderly. *Int J Geriatr Psychiatry* 1999;14:608–17.
23. Li YM, Fu CC. Maternal age and adverse pregnancy outcomes – analysis of birth records from 1997–1999 in Hualien County. *Tzu Chi Med J* 2001;13:95–103. (In Chinese)
24. Lu TH, Sung FC, Li CY. Demographic characteristics and trends in the prevalence of low birth weight from singleton pregnancies in Taiwan, 1978–1997. *J Formos Med Assoc* 2003; 102:313–8.
25. Li YT, Yin CS, Chan CC. Psychosocial risk factors of teenage pregnancy in Eastern Taiwan. *Chin Med J (Taipei)* 1999;62:425–30.
26. Lee PC, Kuo SC, Teng SW, et al. Long-term secular trends in birth weight and gestational age among live births in Taiwan. *Taiwan J Public Health* 2003;22:368–75. (In Chinese)
27. Department of Statistics, Ministry of Interior, R.O.C. *2003 Taiwan-Fuchien Demographic Fact Book, Republic of China*. Taipei: Ministry of the Interior, 2004:466–77, 674–97. Available at: http://www.moi.gov.tw/stat/. (In Chinese)

台灣東部地區母親之人口、心理社會因素與低出生體重嬰兒的關係

李燕鳴[1]　張慈桂[2]

[1]佛教慈濟綜合醫院 家庭醫學科　[2]慈濟大學 公共衛生學系

在台灣東部地區兩所教學醫院內研究低出生體重嬰兒與母親社會人口學特性的關係。使用一份結構式問卷，於 1998－1999 年間在兩院接受產檢孕婦進行面訪，並在一年後查閱醫院病歷及花蓮縣衛生局出生登錄資料檔進行配對，收集該次懷孕生產的資料。在 1,128 位活產單胎生產來看，據世界衛生組織以低於 2,500 克標準，有 6.8% 為低出生體重嬰兒。低出生體重嬰兒較常出現在未成年 (< 20歲)、年長 (> 30歲)、生第一胎者、未結婚、中等或以下教育程度者，或居住在山地鄉地區的母親；未成年母親較多是非計劃性懷孕及有吸菸或飲酒行為。在台灣東部地區要減少低出生體重嬰兒之重點應先預防青少年懷孕。當控制了如情緒壓力和不良家庭功能因素後，發現中等或以下教育程度者、居住在山地鄉者，和生第一胎者之母親特性，仍是影響成年母親產下低出生體重嬰兒的顯著因素。對生第一胎、中等或以下教育程度、及住在山地鄉之孕婦，提供產前照顧時，應要更多的關注，並確保其產前有能有足夠的健康照顧及遵守健康生活型態。

關鍵詞：東臺灣地區，低體位出生，孕產婦，人口、心理社會因素

（高雄醫誌 2005;21:502－10）

收文日期：94 年 4 月 29 日
接受刊載：94 年 8 月 23 日
通訊作者：李燕鳴醫師
佛教慈濟綜合醫院家庭醫學科
花蓮市中央路三段 707 號