

Associations of Intrauterine Growth Restriction Among Term Infants and Maternal Pregnancy Intendedness, Initial Happiness About Being Pregnant, and Sense of Control

Sharon Durousseau, MD, MPH*, and Gilberto F. Chavez, MD, MPH†

ABSTRACT. *Objective.* Term infants (≥ 37 weeks' gestation) who weigh < 2500 g have intrauterine growth restriction (IUGR) and have a higher risk of mortality and morbidity. Little is known about how psychosocial factors affect the risk of IUGR. We examined the association between IUGR and maternal pregnancy intendedness, initial happiness about becoming pregnant, and maternal sense of control.

Methods. We analyzed data from a survey of California mothers aged ≥ 15 years with term live births in 1999 and 2000 ($N = 5961$). Mothers were asked about pregnancy intendedness before pregnancy, initial happiness about becoming pregnant, and maternal sense of control, assessed by a standardized scale. We examined the association of having an infant with IUGR and these factors in univariate and multivariate analyses.

Results. Mothers with low sense of control (3.0%) and average sense of control (2.7%) were more likely to have an infant with IUGR than mothers with high sense of control (1.8%; odds ratio: 1.8; 95% confidence interval: 1.2–2.9; and odds ratio: 1.6; 95% confidence interval: 1.0–2.5). After multivariate analysis, we found no significant association between sense of control and IUGR. We also found no significant association between IUGR and pregnancy intendedness and happiness about becoming pregnant.

Conclusions. We found no statistically significant association between IUGR and maternal pregnancy intendedness, initial happiness about becoming pregnant, and maternal sense of control. Although research should continue to explore associations between psychosocial factors and IUGR, prenatal care programs should focus on known risk factors for IUGR. *Pediatrics* 2003;111:1171–1175; low birth weight, infant, small for gestational age, pregnancy, psychology.

ABBREVIATIONS. LBW, low birth weight; IUGR, intrauterine growth restriction; PTD, preterm delivery; MIHA, Maternal Infant Health Assessment; PNC, prenatal care; OR, odds ratio; CI, confidence interval.

From the *Epidemiology Program Office and the †Division of Reproductive Health, Centers for Disease Control and Prevention, Atlanta, Georgia. Received for publication Oct 2, 2002; accepted Dec 4, 2002. Portions of this article were presented at the American Public Health Association Conference; November 2001; Atlanta, GA. Address correspondence to Sharon Durousseau, MD, MPH, Sleepy Hollow Medical Office Bldg, Department of Pediatrics, 27303 Sleepy Hollow Blvd, Hayward, CA 94545. E-mail: sdurousseau@yahoo.com PEDIATRICS (ISSN 0031 4005). Copyright © 2003 by the American Academy of Pediatrics.

Infants who are born with low birth weight (LBW; birth weight < 2500 g) are divided into 2 categories: those born too early and those born too small. Those born too early or preterm infants have LBW primarily because they did not have adequate gestational time to develop and grow fully. Term infants (≥ 37 weeks' gestation), who, despite having adequate time to grow, are born too small and weigh < 2500 g, have intrauterine growth restriction (IUGR). Although, preterm infants may also have IUGR, for this study we focus on term infants with IUGR.

In 2000, the incidence of IUGR among term infants was 2.0 per 100 live births in California. These infants have higher rates of seizures, sepsis, respiratory failure, and neonatal mortality.¹ Children who are born with IUGR also have more problems with learning and repeat grades more often than children with normal birth weight.^{2–5} Furthermore, IUGR has been implicated as a risk factor for health problems in adulthood, such as adult-onset diabetes, hypertension, and cardiovascular disease.^{6,7}

The 2 categories of LBW—preterm delivery (PTD) and IUGR—are separate infant health outcomes and have different causes. Causes and risk factors for LBW, attributable to both PTD and IUGR, have been studied extensively, although earlier literature primarily grouped PTD and IUGR into the larger LBW category. Maternal risk factors for having an infant with LBW in general include non-Hispanic black race/ethnicity, young age, unmarried marital status, less education, lower income, smoking, poor nutrition, and having had a previous infant with LBW.^{8,9} However, these factors do no account for all of the cases of LBW or all of the racial/ethnic disparities seen between black and white women with respect to the risk of LBW. This has led researchers to search for new causes and risk factors for LBW. Recent literature has demonstrated that maternal stress, isolation, depression, and anxiety were associated with LBW.^{10–14} Some studies have linked high maternal self-esteem, optimistic personality traits, and strong social networks with higher birth weight.^{4,15,16} Other studies, however, did not demonstrate association between birth weight and psychosocial factors after controlling for confounding variables, such as smoking.^{17–19}

Although earlier studies have examined how these psychosocial factors affect LBW risk in general, newer research has focused on how psychosocial

factors affect the risk of PTD. These studies indicate that factors (eg, stress) affect women's risk of having PTD.^{20,21} Few studies have examined the association between psychosocial factors and the risk of IUGR specifically. We conducted a historical cohort study of a statewide population-based sample to assess the association between having a term infant with IUGR and maternal pregnancy intendedness, initial happiness about becoming pregnant, and sense of control.

METHODS

We used data from California's Maternal Infant Health Assessment (MIHA). MIHA is an annual population-based mail/telephone survey that collects information about pregnancy-related conditions and behaviors. Survey methods have been described in detail previously.²² The sample included California resident women who were aged ≥ 15 years and delivered singletons, twins, or triplets during February to May 1999 and from February to May 2000. Eligible participants (156 514 in 1999, 156 671 in 2000) were stratified by region of residence, race/ethnicity, and education. From these strata, 4967 women in 1999 and 5027 women in 2000 were randomly selected. Non-Hispanic black women were oversampled to ensure large enough numbers for analysis. Potential participants were mailed English and Spanish self-administered questionnaires at 2 to 4 months postpartum with telephone follow-up for nonrespondents. The 1999 and 2000 data sets were merged for a final sample size of 7044 mothers. We restricted analysis to mothers with term infants to focus on the effects of the study variables on IUGR only without mixing in the effects that these factors might have on PTD.

The study outcome was the birth of a term infant (>37 weeks' gestation) with birth weight <2500 g. Predictor variables included pregnancy intendedness, initial happiness about becoming pregnant, and maternal sense of control. We classified pregnancy intendedness into 4 groups: wanted; mistimed; unwanted; or undetermined on the basis of whether before pregnancy the mother wanted to get pregnant then, later, or not at all or was unsure, respectively. To evaluate a mother's initial happiness about becoming pregnant, we asked mothers how they felt when they first discovered that they were pregnant: very happy, somewhat happy, somewhat unhappy, very unhappy, and unsure. To assess maternal sense of control, we used the Pearlin Personal Mastery Scale, which measures the extent to which one believes that one has control over one's life versus fate having control.^{23,24} Mothers were asked whether they strongly agreed, agreed, disagreed, or strongly disagreed with a series of 7 statements (Table 1). Responses for statements 1, 2, 3, 5, and 7 were given points: 1 for strongly agreeing, 2 for agreeing, 3 for disagreeing, and 4 for strongly disagreeing. Point scores for responses to statements 4 and 6 were reversed. These points were added together to obtain an overall numeric score ranging from 7 (low) to 28 (high), which were divided into high, average, and low tertiles.

Potential confounding variables included maternal race/ethnicity, age, education, insurance type, first trimester prenatal care (PNC), income, smoking during pregnancy, alcohol use during pregnancy, prepregnancy weight, intrapregnancy weight gain, intimate partner violence, and history of having an infant with LBW. Weighted data were analyzed in SUDAAN version 8.0²⁵ to correct for stratified sampling and oversampling of non-Hispanic

black women and to minimize nonresponse bias. We calculated odds ratios (ORs) with 95% confidence intervals (CIs) for the association of IUGR and each predictor variable and control variable. Because the outcome is rare (2%), we used OR to estimate relative risk. We then conducted a multivariate analysis to test for potential interactive terms and confounding. All predictor and control variables associated with IUGR in univariate analysis at $P \leq .05$ were included in the initial model. Using a backward stepwise logistic regression method, we modified the model to obtain the best fit. Variables were considered confounders when the OR changed when they were removed from the model. Each variable was also tested for inclusion using the maximum likelihood ratio test.²⁶ Interactive terms between significant predictor variables and control variables were tested for significance using cross-product terms in logistic regression.

RESULTS

A total of 3483 (70%) responded in 1999 and 3561 (71%) responded in 2000 (total 7044); of these, 5941 were mothers of term infants. Among these mothers, 40% were Hispanic, 37% were non-Hispanic white or other, 13% were non-Hispanic black, and 9% were Asian/Pacific Islander. Nearly two thirds had incomes above the federal poverty line, and 64% were married. Among sample mothers, 50% were 20 to 29 years, 31% had some college education, 61% had private or health maintenance organization insurance, and 80% had received first-trimester PNC (Table 2).

A total of 145 (2.4%) mothers had infants who had IUGR, and 5816 (97.6%) mothers had normal-weight infants, similar to California's IUGR rate. Mothers with infants who had IUGR were more likely to be non-Hispanic black or Asian/Pacific Islander, to be younger than 20, to have less than a high school education, to be unmarried, to have MediCal/Medicaid insurance, to have smoked during pregnancy, and to have a history of having an infant with LBW (Table 2). Factors not statistically associated with IUGR in this sample included income, having first-trimester PNC, alcohol consumption during pregnancy, prepregnancy weight, intrapregnancy weight gain, and intimate partner violence (Table 2).

We found that 3% of mothers with low sense of control and 2.7% of mothers with average sense of control had infants with IUGR compared with 1.8% of mothers with high sense of control (OR: 1.8; 95% CI: 1.2–2.9 and OR: 1.6; 95% CI: 1.0–2.5, respectively; Table 2). There was no statistically significant association between IUGR and pregnancy intendedness or initial happiness about becoming pregnant (Table 2). Control variables considered in the final model included maternal age, race/ethnicity, education, smoking, and history of having an infant with LBW. After controlling for these variables, there was no statistically significant association between sense of control and IUGR, although there was a trend suggestive of increased odds of IUGR with lower sense of control (Table 3). Interaction terms between sense of control and each control variable were not statistically significant and were not included in the final model. Control variables independently associated with IUGR after adjustment included being non-Hispanic black or Asian/Pacific Islander, age <20 years, smoking during pregnancy, and history of having an infant with LBW (Table 3).

TABLE 1. Statements included in the Pearlin's Mastery Scale

Question: How much do you agree or disagree with the following statements? (Responses: Agree strongly, agree somewhat, disagree somewhat, disagree strongly)

- 1 There is really no way I can solve some of the problems I have.
- 2 Sometimes I feel that I'm being pushed around in life.
- 3 I have little control over the things that happen to me.
- 4 I can do just about anything I really set my mind to do.
- 5 I often feel helpless in dealing with problems of life.
- 6 What happens to me in the future mostly depends on me.
- 7 There is little I can do to change many of the important things in my life.

TABLE 2. Crude ORs of the Association of Sociodemographic Variables and Health Behaviors and IUGR Among a Sample Population of Women Delivering Term Infants in California, 1999–2000

	Total (n = 5961)	% IUGR (n = 145)	OR	95% CI
Demographic variables				
Race/ethnicity*				
Non-Hispanic White/other	2161 (37%)	38 (1.8%)	Ref	
Non-Hispanic black	786 (13%)	36 (4.6%)	3.1	(1.9–5.1)
Asian/Pacific Islander	555 (9%)	19 (3.4%)	2.0	(1.1–3.9)
Hispanic	2364 (40%)	141 (2.4%)	1.2	(0.8–1.9)
Maternal age*				
<20 y	676 (11%)	27 (4.0%)	2.1	(1.2–3.7)
20–29 y	2963 (50%)	65 (2.2%)	Ref	
30–39 y	2171 (36%)	49 (2.3%)	1.4	(0.8–2.3)
>40 y	151 (3%)	4 (2.6%)	Ref	(0.5–1.7)
Maternal education*				
<High school	1360 (23%)	47 (3.5%)	2.1	(1.2–3.5)
High school grad	1367 (23%)	32 (2.3%)	1.4	(0.8–2.4)
Some college	1857 (31%)	44 (2.4%)	1.5	(0.9–2.6)
College graduate	1325 (22%)	22 (1.7%)	Ref	
Insurance status*				
Private or health maintenance organization	3603 (61%)	72 (2.0%)	Ref	
MediCal/Medicaid	2235 (38%)	68 (3.0%)	1.5	(1.0–2.1)
Other	117 (2%)	5 (4.3%)	2.1	(0.8–5.6)
Income level†				
<100% federal poverty line	1909 (36%)	55 (2.9%)	1.4	(0.9–2.2)
100%–200% of federal poverty line	1153 (22%)	23 (2.2%)	1.1	(0.7–1.8)
>200% of federal poverty line	2237 (42%)	44 (2.0%)	1	
Marital status†				
Married	3808 (64%)	75 (2.0%)		
Unmarried	2153 (36%)	70 (3.3%)	1.6	(1.2–2.3)
Health behavior/clinical and social variables				
PNC*				
First trimester	4791 (80%)	114 (2.4%)		
After first trimester	1170 (20%)	21 (2.6%)	1.1	(0.6–1.9)
Smoked cigarettes during pregnancy†				
No	5286 (90%)	110 (2.1%)		
Yes	614 (10%)	31 (5.0%)	2.3	(1.5–3.6)
Alcohol consumption during pregnancy†				
No	4732 (82%)	114 (2.4%)		Ref
Yes	1065 (18%)	26 (2.4%)	1.3	(0.7–2.2)
Body mass index‡ <18 before pregnancy†				
No	5396 (97%)	125 (2.3%)		
Yes	194 (3%)	8 (4.1%)	2.1	(0.98–4.4)
Adequate weight gain§ during pregnancy‡				
Yes	5376 (96%)	129 (2.1%)		
No	231 (4%)	5 (2.1%)	1.1	(0.4–2.6)
Previous LBW birth‡				
No	5616 (96%)	114 (2.0%)		
Yes	253 (4%)	28 (11.1%)	6.1	(3.8–9.8)
Exposed to intimate partner violence				
Yes	2724 (94%)	50 (1.8%)		
Exposure variables				
Pregnancy intention				
Wanted	3062	70 (2.3%)	Ref	
Mistimed	1508	38 (2.5%)	1.1	0.7–1.7
Unwanted	476	13 (2.7%)	1.2	0.6–2.3
Undetermined	809	23 (2.8%)	1.5	0.9–2.4
Initial happiness about becoming pregnant				
Very happy	3823	90 (2.4%)	Ref	
Somewhat happy	933	20 (2.1%)	0.9	0.6–1.6
Somewhat unhappy	240	7 (2.9%)	1.4	0.7–3.8
Very unhappy	219	7 (3.2%)	1.7	0.7–3.8
Not sure	660	20 (3.0%)	1.3	0.8–2.2
Sense of control score				
High	2217	39 (1.8%)	Ref	
Average	1688	46 (2.7%)	1.6	1.0–2.5
Low	1659	49 (3.0%)	1.8	1.2–2.9

* From birth certificate linked data.

† From MIHA.

‡ Defined as prepregnancy weight in kilograms/height in meters squared.

§ Defined based on recommendations endorsed by the Institute of Medicine, American College of Obstetricians and Gynecologists, and American Academy of Pediatrics for pregnancy weight gain based on prepregnancy body mass index.

|| Defined as positive if present within the last 2 years.

TABLE 3. Adjusted ORs for the Association Between IUGR and Sense of Control Score and Maternal Sociodemographic Characteristics Among a Sample Population of Women Delivering Term Infants, California 1999–2000

Variable	Categories	Adjusted OR	95% CI
Race/ethnicity	Non-Hispanic white/other	Ref	
	Non-Hispanic black	3.1	1.6–5.8
	Asian/Pacific Islander	2.8	1.4–5.8
	Hispanic	1.0	0.5–2.1
Age	<20 y	1.9	1.0–3.8
	20–29 y	Ref	
	30–39 y	1.4	0.7–2.6
	>40 y	1.2	0.6–2.4
Maternal education	<High school	1.9	0.7–5.0
	High school graduate	1.2	0.5–2.9
	Some college	1.7	0.8–3.7
	College graduate	Ref	
Smoked cigarettes during pregnancy	Yes	2.4	1.4–4.2
	No	Ref	
Previous birth	Yes	5.2	2.8–10.0
	No	Ref	
Sense of control score	High	Ref	
	Average	1.4	0.8–2.4
	Low	1.5	0.8–2.8

DISCUSSION

In this population-based sample, lower maternal sense of control was associated with IUGR in univariate analysis; however, the association was no longer statistically significant once we controlled for potential sociodemographic variables that may be confounders. We also found no correlation between pregnancy intendedness or initial happiness about becoming pregnant and IUGR. Several limitations should be considered when assessing these results. Measuring pregnancy intendedness and maternal happiness about pregnancy can be difficult. Factors that were not evaluated in the MIHA survey, such as the partner's feelings about the pregnancy, may affect maternal feelings and attitudes toward pregnancy. Furthermore, these feelings and attitudes may change throughout pregnancy.^{27–29} Recall bias may occur because mothers with infants who have IUGR may recall their attitudes and sense of control early in pregnancy differently than mothers of normal-weight infants. We might not be able to generalize these results to all mothers with infants who have IUGR. Preterm infants may also have IUGR, but mothers of preterm infants are excluded from this analysis. Also excluded are non-English- and non-Spanish-speaking mothers, mothers aged <15 years, and mothers with incomplete contact information. The sample is also drawn only from women with live births between February and May, and there may be differences between mothers who gave birth during these months versus other times of the year with respect to the variables studied; however, this has not been examined in previous research.

There is limited earlier literature on the role of sense of control and pregnancy outcomes, especially IUGR. In contrast to our data, Goldenberg et al³⁰ found a significant correlation between poor psychosocial resources and IUGR using a scale developed from 5 existing scales that included the Pearlin Mastery Scale. Other authors have looked at how sense of control might affect health outcomes. Taylor and

Seeman³¹ concluded that sense of control might act as a mediator of the effects of socioeconomic status on health, and Pearlin et al²³ postulated that sense of control may have an impact on how one copes with stress, perhaps modulating how stress affects health outcomes. Literature also suggests that other measures of control, such as locus of control (how much someone feels others, chance, or they themselves have control over their own lives or health), may have an impact on access to health care services, health behaviors, and participation in screening activities.^{32–35} Shiono et al¹⁶ also found that having a chance locus of control was associated with a lower mean birth weight but did not specifically address how this factor affects IUGR. With respect to literature on pregnancy intendedness and LBW and IUGR, US and international studies have demonstrated an association between pregnancy intendedness and LBW in general.^{36,37} Bitto et al³⁸ found no association between having an unplanned pregnancy and having an LBW birth, which is similar to our findings.

Associations between other psychosocial factors and IUGR should be explored further to understand better how stress and psychosocial resources have an impact on fetal growth and possibly in a prospective manner to limit potential biases. Programs aimed at lowering the IUGR rate should continue to focus on women who are known to be at risk for IUGR, namely, women with previous LBW infants (who had the highest risk of having an infant with IUGR in this analysis), non-Hispanic black and Asian/Pacific Islander women, women aged ≤ 19 years, and women who smoke during pregnancy. PNC providers should continue to screen women for these easily identifiable risk factors—especially previous pregnancy history and smoking status—to assess the risk of LBW and IUGR. By screening for women for known risk factors for having an infant with IUGR, counseling and prevention measures can be insti-

tuted for those who are most at risk for this adverse pregnancy outcome.

ACKNOWLEDGMENTS

The MIHA is a collaborative effort between the California Department of Health Services, Maternal Child Health Branch, and the University of California San Francisco Department of Family and Community Medicine. The study was conducted while the author was an Epidemic Intelligence Officer with the Centers for Disease Control and Prevention as a field assignee to the California Department of Health Services.

We thank Paula Braveman, MD, MPH, and Kristen Marchi, MPH (University of California, San Francisco), who participated in the design of the MIHA and reviewed manuscripts; Andrea Winquist, MD (Centers for Disease Control and Prevention), for help with the manuscript; and David Kleinbaum, PhD (Emory University), for offering advice on logistic regression.

REFERENCES

- McIntire D, Bloom SL, Casey BM, Leveno KJ. Birthweight relation to morbidity and mortality among newborn infants. *New Engl J Med*. 1999;340:1234–1238
- Fitzhardinge PM, Steven EM. The small-for-dates infant II: neurological and intellectual sequelae. *Pediatr*. 1972;50:50–57
- Low JA, Galbraith RS, Muir D, Killen H, Pater B, Karchmar J. Intrauterine growth retardation: a study of long term morbidity. *Am J Obstet Gynecol*. 1982;142:670–677
- Pax I, Gale R, Laor A, Danon YL, Stevenson DK, Seidman DS. The cognitive outcome of full-term small-for-gestational-age infants at late adolescence. *Obstet Gynecol*. 1995;85:425–456
- Strauss RS. Adult functional outcome of those born small for gestational age: twenty-six-year follow-up of the 1970 British birth cohort. *JAMA*. 2000;283:625–632
- Luo Z, Karlberg J. Critical growth phases for adult shortness. *Am J Epidemiol*. 2000;152:125–131
- Karlberg J, Albertsson-Wikland K. Growth in full term small-for-gestational-age infants: from birth to final height. *Pediatr Res*. 1995;38:733–739
- Kiely JL, Brett KM, Yu S, Rowley DL. Low birthweight and intrauterine growth retardation. In: Wilcox LS and Marks HS, eds. *From Data to Action: CDC's Public Health Surveillance for women, Infants and Children*. Washington, DC: US Department of Health and Human Services; 1994: 185–202
- Institute of Medicine. *Preventing Low Birthweight*. Washington, DC: National Academy Press; 1985
- Wadhwa PD, Sandman CA, Porto M, Dunkel S, Schetter C, Gartite TJ. The association between prenatal stress and infant birth weight and gestational age at birth: a prospective investigation. *Am J Obstet Gynecol*. 1993;169:858–865
- Dejin-Karlson E, Hanson BS, Ostergen PO, Lindgren A, Sjoberg N. Association of a lack of psychosocial resources and the risk of small-for-gestational-age infants: a stress hypothesis. *Br J Obstet Gynaecol*. 2000;107:89–100
- Sable MR, Wilkinson DS. The impact of major stress, major life events and pregnancy attitudes on low birth weight. *Fam Plann Perspect*. 2000; 32:288–294
- Lobel M, DeVincent CJ, Kaminer A, Meyer BA. The impact of prenatal stress and optimistic disposition on birth outcomes in medically high-risk women. *Health Psychol*. 2000;19:544–553
- Da-Costa D, Drista M, Larouche J, Brender W. Psychosocial predictors of labor and delivery complications and infant birth. *J Psychosom Obstet Gynecol*. 2002;21:137–148
- Robert E. Neighborhood social environments and the distribution of low birthweight in Chicago. *Am J Public Health*. 1997;87:597–603
- Shiono PH, Rauh VA, Park M, Lederman SA, Zuskar D. Ethnic difference in birthweight: the role of lifestyle and other factors. *Am J Public Health*. 1997;87:787–793
- Nordentoft M, Lou H, Hansen D, et al. Intrauterine growth retardation and premature delivery: the influence of maternal smoking and psychosocial factors. *Am J Public Health*. 1996;86:346–354
- Aaars MC, Vingerhoet AJ. Psychosocial factors and intrauterine fetal growth: a prospective analysis. *J Psychosom Obstet Gynecol*. 1993;14: 249–258
- Schatz D, Harder D, Schatz M, et al. The relationship of maternal personality characteristics to birth outcomes and infant development. *Birth*. 2000;21:25–31
- Copper RL, Goldenberg RL, Das A, et al. The pre-term prediction study: maternal stress is associated with spontaneous birth at less than thirty-five weeks gestation. *Am J Obstet Gynecol*. 1996;175:1286–1292
- Whitehead N, Hill HA, Brogan DJ, Blackmore-Prince C. Exploration of threshold analysis in the relation between stressful life events and preterm delivery. *Am J Epidemiol*. 2002;155:117–124
- Wells K, Heck KE, Takahashi ER. *Knowledge Attitudes and Behavior of California Mothers: Results From the Maternal Infant Health Assessment Survey, 2000*. Sacramento, CA. In press
- Pearlin LI, Schooler C. The structure of coping. *J Health Soc Behav*. 1978;19:2–21
- Research Network on Socioeconomic Status and Health. Available at: www.macses.ucsf.edu/research/psychosocial/notebook/control.html
- Shah B, Barnwell BG, Bieler GS. *SUDAAN Software for the Statistical Analysis of Correlated Data User's Manual Release 7.5, Volumes 1 and 2*. Research Triangle Park, NC: Research Triangle Institute; 1997
- Kleinbaum DG. *Logistic Regression: A Self-Learning Text*. New York, NY: Harper Collins Publishing; 1994
- Klerman L. The intendedness of pregnancy: a concept in transition. *Matern Child Health J*. 2000;4:155–161
- Campbell AA, Mosher WD. A history of unintended pregnancies and births. *Matern Child Health J*. 2000;4:163–169
- Stanford JB, Hobbs R, James P, DeWitt MJ, Fisher RC. Defining dimensions of pregnancy intendedness. *Matern Child Health J*. 2000;4:83–190
- Goldenberg RL, Hickey CA, Cliver SP, Gotlieb SI, Woolley TW, Hoffman HJ. Abbreviated scale for the assessment of psychosocial status in pregnancy: development and evaluation. *Acta Obstet Gynecol Scand*. 1997;S7:19–24
- Taylor SE, Seeman TE. Psychosocial resources and the SES-health relationship. *Ann N Y Acad Sci*. 1999;22:210–255
- Chippenfield JG, Greensdale L. Perceived control as a buffer in the use of health care services. *J Gerontol*. 1999;56:146–154
- Gregg EW, Kriska AM, Narayan KM, Knowler W. Relationship of locus of control to physical activity among people with and without diabetes. *Diabetes Care*. 1996;19:1118–1121
- Bundek NI, Marks GL, Richardson JL. Role of health locus of control beliefs in cancer screening of elderly Hispanic women. *Health Psychol*. 1993;12:193–199
- Walker LO, Cooney AT, Riggs MW. Psychosocial and demographic factors related to health behaviors in the first trimester. *J Obstet Gynecol Neonatal Nurs*. 1999;28:606–614
- Riini CK, Dunkel-Schetter C, Wadwa PD, Sandman CA. Psychosocial adaptation and birth outcomes: the role of personal resources, stress and socio-cultural context in pregnancy. *Health Psychol*. 1999;18:333–345
- Eggleston E, Ong A, Kotelchuk M. Unintended pregnancy and low birthweight in Ecuador. *Am J Public Health*. 2001;91:808–810
- Bitto A, Gray R, Simpson JL, et al. Adverse outcomes of planned and unplanned pregnancies among users of natural family planning: a prospective study. *Am J Public Health*. 1997;87:338–343

Associations of Intrauterine Growth Restriction Among Term Infants and Maternal Pregnancy Intendedness, Initial Happiness About Being Pregnant, and Sense of Control

Sharon Durose and Gilberto F. Chavez
Pediatrics 2003;111;1171

Updated Information & Services	including high resolution figures, can be found at: http://pediatrics.aappublications.org/content/111/Supplement_1/1171
References	This article cites 31 articles, 2 of which you can access for free at: http://pediatrics.aappublications.org/content/111/Supplement_1/1171#BIBL
Subspecialty Collections	This article, along with others on similar topics, appears in the following collection(s): Adolescent Health/Medicine http://www.aappublications.org/cgi/collection/adolescent_health:medicine_sub Teen Pregnancy http://www.aappublications.org/cgi/collection/teen_pregnancy_sub Substance Use http://www.aappublications.org/cgi/collection/substance_abuse_sub
Permissions & Licensing	Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at: http://www.aappublications.org/site/misc/Permissions.xhtml
Reprints	Information about ordering reprints can be found online: http://www.aappublications.org/site/misc/reprints.xhtml

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™



PEDIATRICS®

OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

Associations of Intrauterine Growth Restriction Among Term Infants and Maternal Pregnancy Intendedness, Initial Happiness About Being Pregnant, and Sense of Control

Sharon Duroseau and Gilberto F. Chavez
Pediatrics 2003;111;1171

The online version of this article, along with updated information and services, is located on the World Wide Web at:

http://pediatrics.aappublications.org/content/111/Supplement_1/1171

Pediatrics is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. Pediatrics is owned, published, and trademarked by the American Academy of Pediatrics, 141 Northwest Point Boulevard, Elk Grove Village, Illinois, 60007. Copyright © 2003 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 1073-0397.

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™

