Adequacy of Prenatal Care Among Inner-City Women

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Background. Lack of prenatal care is a well-recognized risk factor for infant mortality and low birthweight. This study was conducted to identify factors that facilitate or inhibit access to prenatal care among low-income inner-city women.

Methods. A case-control interview study was conducted with women during their postpartum hospitalization at a midwestern inner-city hospital. Fifty-eight women who had received no prenatal care and 71 women who had received markedly inadequate prenatal care were compared with 123 controls who had received intermediate or adequate prenatal care.

Results. The majority of subjects were minorities, single, had low incomes, and were in the Medicaid program. Subjects' median age was 23 years and median parity 2, and the majority had not completed high school. Inadequate prenatal care was independently associated with the following variables (adjusted odds ratios): lack of any insurance, including Medicaid (5.3), being a smoker (3.8), being homeless (2.7), being black (2.5), not being worried what the physician or nurse might say (2.4), not using contraception (2.1), having a household income of less than $400 a month (1.8), being ashamed or afraid of the pregnancy or the physician (1.4), having transportation problems (1.3), and level of education (0.8).

Conclusions. Practical factors related to poverty are substantial barriers to obtaining prenatal care. Comprehensive approaches to prenatal services that address these barriers may be more effective in facilitating adequate prenatal care among low-income women.

Key words. Prenatal care; patient compliance; urban health. (*J Fam Pract 1993; 37:575-582*)

Lack of prenatal care is a well-recognized risk factor for poor perinatal outcomes.[1] The relative risk for low birthweight and perinatal mortality is roughly double among women who receive little or no prenatal care.[2–5]

In response to increasing information about the relation between prenatal care and pregnancy outcomes, many states expanded Medicaid eligibility for pregnant women in the 1980s. A recent study from Tennessee found that expanded Medicaid eligibility was not followed by any improvement in the use of early prenatal care, birthweight, or neonatal mortality[6]; a study of Medicaid expansion in Massachusetts found that access to prenatal care appeared to decline over the same period that pregnancy coverage was expanded.[7] A substantial percentage (5% to 6%) of women in the United States continue to receive care only in the third trimester or not at all, with some geographic areas having much higher rates.[8] This proportion actually increased between 1982 and 1987.[9] The lack of improvement has been attributed to the need for improved content of care,[10,11] more prenatal care providers,[12] and greater accessibility to care.[13]

Although removing financial barriers is critical to improving access to prenatal care, it may not be sufficient. Many women who receive no care or receive care late in the pregnancy are in the Medicaid program.[14–17] To design effective interventions that may improve early registration for prenatal care, a better understanding of factors that facilitate or inhibit access to care among low-income women is needed. To explore these factors, we conducted a case-control study of low-income women, comparing those who had adequate or interme-

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diate care with those who had inadequate or no care. Through in-depth interviews during the postpartum hospitalization period, data were collected on practical and psychological barriers to care, previous connection to the health care system, beliefs about prenatal care, emotional support systems, substance abuse, and birth outcomes. Because younger age and higher parity are well-known, nonmodifiable risk factors,[15–19] we chose to match subjects according to age and parity in order to focus on other variables.

Methods

Population

Case patients and control patients were identified from among all women giving birth at Cleveland's county hospital, which performs approximately 3600 deliveries per year. Women with inadequate or no prenatal care were identified consecutively from the delivery log from May 1991 through March 1992. Inadequate care was defined by the Kessner index,[20] which combines the trimester in which care began and the number of visits, adjusted for gestational age, to determine the adequacy of prenatal care. For each case patient, a control patient was identified as the woman who gave birth closest in time to the case patient and who was the same age ± 2 years, and of the same parity ± 1, but had received an adequate or intermediate level of prenatal care. Women who had given birth to twins, whose infants were being put up for adoption, and whose infants had died were excluded.

Data Collection

After informed consent was obtained, interviews were conducted by two trained interviewers on the postpartum floor. The interview consisted of a structured series of open- and closed-ended questions regarding reasons for obtaining or not obtaining prenatal care; previous experience with prenatal and other medical care; sources of information about care; social support, demographic data, and information on homelessness (women stating they did not have a place of their own to live were considered homeless), economic problems, and substance abuse. Standardized interview forms were completed by the interviewer. Responses to open-ended questions were recorded in the subject's own words. The interview questionnaire was reviewed for content validity by obstetric care providers, nursing staff members, a social worker, and a sociologist. Medical records were reviewed and infant outcomes recorded for every completed interview. A standardized record-abstracting form was completed. Record reviews documented amount and timing of prenatal care, information about maternal laboratory results, pregnancy complications, infant birthweight, and infant outcomes. For cases in which the patient's report of the amount of care received differed from the delivery log and prenatal care records to the extent that her adequacy of care would be reclassified, the first author contacted the patient's caregiver to verify her report.

Data Analysis

Quantitative data were coded and entered into a microcomputer. Descriptive statistics, univariate analyses with *t* tests for normally distributed continuous variables, chi-square for categorical variables, and multiple logistic regression analysis were generated using SPSS/PC software.[21] For the multiple logistic regression analysis, a backward stepwise approach was used, with $P > .10$ set as the level for exclusion of variables from the model. Variables initially were selected for the model based on statistical significance in univariate analysis at $P < .05$ or on the basis of previous studies. Qualitative information from open-ended questions was reviewed to define and rank common themes.

Results

Interviews with 129 case patients and 123 control patients were completed. Two women in the case group and one in the control group were excluded because of stillbirth or neonatal death. Thirty-eight case patients and 36 control patients were not interviewed because interviewers were not able to contact them before discharge. Nine women in the case group and eight women in the control group refused to be interviewed. Median age and parity of women in the case group who were not interviewed were somewhat higher; for women in the case group, median age was 24 years (range 17 to 46 years) and parity 3 (range 0 to 10) for those not interviewed, compared with 22 years (range 15 to 36) and parity 2 (range 0 to 8) for completed interviews. Women in the control group not interviewed had a median age of 22 years (range 15 to 34 years) and parity 1 (range 0 to 7), compared with 23 years (range 15 to 37 years) and parity 2 (range 0 to 8) for completed interviews. For each variable, never more than 5% of the data were missing. Percentages were adjusted for missing data.

Table 1. Demographic Characteristics and Insurance Status for Patients Who Received Inadequate vs Intermediate or Adequate Prenatal Care

Characteristics	Inadequate Care Group (n = 129)*	Intermediate or Adequate Care Group (n = 123)*	*P* Value
Median age, y (range)	22 (15–36)	23 (15–37)	NS
Median parity† (range)	2 (0–8)	2 (0–8)	NS
Median level of education, y (range)	11 (7–14)	12 (6–17)	<.05
Race, %			
Black	53	38	—
White	38	47	—
Hispanic	7	12	—
Other	2	2	—
Married, %	14	36	<.001
Insurance status, %			<.05
No insurance	12	3	—
Private insurance	2	12	—
Medicaid	87	84	—
Applied for Medicaid, %			<.05
Before pregnancy	49	35	—
During pregnancy	51	65	—

**Data were missing for some items. Percentages were calculated using only the data available for that particular characteristic.*
†Reported parity did not include the current pregnancy.
NOTE: Percentages do not total to 100 because of rounding.

Subject Characteristics

Demographic and insurance characteristics of study participants are listed in Table 1. Although a higher percentage of women in the case group were black, as opposed to Hispanic or white, this was not significant in univariate analysis. Median education was higher by 1 year for women in the control group. Women in the case group were less likely to be married. Although a large majority of women in both groups had Medicaid assistance, a higher percentage of women in the case group had no insurance of any kind. Surprisingly, a greater percentage of women in the case group were in the Medicaid program before their pregnancies began. Among women who applied during pregnancy, women in the case group were twice as likely to receive their Medicaid card during the last trimester.

Medical Care Utilization

Nearly all multiparous women in both groups stated that they had received prenatal care for previous pregnancies. A minority of women in both groups reported that their current pregnancy had been planned, but 43% of women in the case group reported not using any contraception in the past 2 years, compared with 27% in the control group ($P < .01$). Based on record review, 58 women in the case group had no prenatal care at all; 71 received inadequate care as defined by the Kessner index. In the inadequate care group, the mean number of prenatal visits as documented by record review was 2.6, compared with 9.9 for women in the control group. The number of prenatal visits was assessed both by self-report and by record review. In both groups, the number of reported visits exceeded the number that could be documented by record review. Among women who had any prenatal care appointments, most were seen in the same trimester in which they called for an appointment. By self-report, 62% of those women in the case group who had made any visits had been seen by the end of the second trimester, compared with 98% of women in the control group.

When asked about their primary reason for not getting prenatal care (Table 2), women in the case group reported practical barriers such as lack of transportation or child care, homelessness, or no insurance or money to pay for more frequent care, and psychological reasons such as fear or shame related to the pregnancy or seeing the physician. One third of the group was unable to identify a primary reason and cited multiple reasons.

Table 2. Primary Reason Given by Women for Not Receiving Adequate Prenatal Care

Primary Reason	Inadequate Care Group, % (n = 129)
No transportation	14
No child care	11
No insurance or no money	9
Homeless or housing problems	3
Afraid to go to the doctor	7
Afraid to be pregnant	4
Clinic wait too long	4
Might get caught using drugs	2
Felt all right or did not think care was needed	2
Did not know where to go	2
Ashamed of pregnancy	1
No evening or weekend appointments	1
Got advice somewhere else	1
Did not know how to apply for insurance	1
Had a bad experience with last pregnancy	1
Some other reason	1
Multiple reasons (cannot name main one)	33

NOTE: Percentages do not total 100 because of rounding.

Social Support and Emotional Factors

For both groups, the source of greatest support was most often reported to be the woman's mother, not the father of the baby, although the father was most often noted as the person who would help care for the baby. Although women in the case group were less likely to report they were happy about the baby, they were more likely to report that the father was happy about the baby. Fewer women in the case group were worried about what a physician or nurse might tell them during their pregnancy (26% vs 40%), and more case patients were afraid to see a physician (19% vs 7%) (Table 3).

Economic Barriers

Economic status differed between groups (Table 4). The majority of women (57%) in the case group reported an income of less than $400 per month, a significantly different percentage from that of the control group (40%). The mean number of children (2) and adults (1) supported by that income was identical for both groups. Although difficulty in paying for transportation was most common in both groups, it was more common for women in the case group (33% vs 20%). Homelessness was a greater problem for women in the case group as well, with only 65% having a place of their own to live, compared with 83% of the control group. Both groups were highly mobile; approximately 40% in each group had moved in the 10 months before giving birth.

Table 3. Emotional Factors Associated with Women Receiving Inadequate Prenatal Care

Factor	Inadequate Care Group, % (n = 129)*	Intermediate or Adequate Care Group, % (n = 123)*	*P* Value
Afraid to go to the doctor	19	7	<.01
Ashamed to be pregnant	14	8	NS
Afraid to be pregnant	22	18	NS
Afraid or ashamed of pregnancy or afraid of the doctor	36	22	<.05
Happy or somewhat happy about baby	75	98	<.05
Unhappy about baby	7	2	<.05
Father of baby happy or somewhat happy about baby	77	80	NS
Father of baby unhappy or very unhappy about baby	7	16	<.05
Worried about what doctor or nurse might say	27	40	<.05

**Data were missing for some items. Percentages were calculated using only the data available for that particular factor.*

Table 4. Economic Barriers to Prenatal Care

Barrier	Inadequate Care Group, % (n = 129)*	Intermediate or Adequate Care Group, % (n = 123)*	*P* Value
Income <$400 per month	57	40	<.05
Mean number supported by income (±SD)			
Adults	1.2 (±5)	1.4 (±1.0)	NS
Children	1.9 (±1.9)	1.9 (±1.9)	NS
Found it hard to pay for			
Food	14	16	NS
Clothing	16	17	NS
Rent	16	18	NS
Transportation	33	20	<.05
Doctor bills	13	8	NS
Do not have own place to live	35	17	<.01
Moved in the last 10 months	43	39	NS

**Data were missing for some items. Percentages were calculated using only the data available for that particular economic barrier.*

Substance Abuse

Self-reported smoking and drug abuse were considerably more common among women in the case group. Fifty-nine percent of women in the case group reported smoking during pregnancy, compared with 30% of women in the control group ($P < .001$). Fifteen percent of women in the case group reported some drug use during pregnancy, compared with 4% in the control group ($P < .01$). Results of toxic screening tests for illicit drugs were more often positive in the case group, but women in the case group were more likely to have a toxic screening test performed (44 vs 9), introducing a high likelihood of biased results.

Knowledge

When asked "If a woman feels fine while she is pregnant, do you think there is still a need for her to see a doctor and get prenatal care?" more than 90% of women in both groups answered yes. Most identified that a woman should go for care "within weeks" of recognizing her pregnancy. Eleven women in the case group said they did not know when a woman should go for prenatal care.

Qualitative analysis of responses to open-ended questions supported the results of the closed-ended questions. When asked what would help women to come early and often for care, 44 women in the case group mentioned help with practical barriers. Most frequently mentioned were help with transportation and child care, followed by medical insurance and more convenient appointment times. The next most common response to this question was "don't know" or "nothing," given by 29 women in the case group.

Birth Outcomes

Infant outcomes are shown in Table 5. Mean birthweight was 405 g lower in infants of the case group than in those of the control group, and the frequency of low birthweight was 5 times higher ($P < .001$). Infants of women in the case group more often had problems in the normal nursery and more often were placed in the neonatal intensive care unit, but these differences were not statistically significant.

Multivariate Analysis

Although initially parity, age, marital status, self-report of drug abuse, how the father felt about the baby, how the woman felt about the baby, and how the woman felt about the father were included in the logistic regression analysis, they were not found to be statistically significant factors. In the final model, not having insurance or Medicaid assistance, being a smoker, not having a place of one's own to live, being black, not being worried what the physician or nurse might say, not using contraception for the past 2 years, having a household income of less than $400 a month, being ashamed or afraid of the physician or the pregnancy, having transportation problems, and having less education were the variables significantly associated with receiving inadequate or no prenatal care at $P \leq .05$. Odds ratios with confidence intervals for these variables are shown in Table 6.

Table 5. Outcomes of Infants Born to Women Who Received Inadequate vs Intermediate or Adequate Prenatal Care

Outcome Measure	Inadequate Care Group (n = 121*)	Intermediate or Adequate Care Group (n = 123)	*P* Value
Birthweight, g (mean ±SD)	2925 ± 554	3330 ± 489	<.001
Low birthweight, %	20	4	<.001
Nursery status, %†			NS
Placed in normal nursery, no problems	75	88	
Placed in normal nursery, had problems	16	9	
Placed in neonatal intensive care unit	9	4	

**Birthweight was not available for 8 of the infants of mothers who received inadequate prenatal care (n = 129).*
†Information on nursery status was available for only 121 of the infants whose mothers received inadequate prenatal care and 112 of the infants whose mothers received intermediate or adequate prenatal care.

Discussion

Our data emphasize that although the majority of women in our study had some degree of access (they were in the Medicaid program, and multiple community clinics exist to provide care), economic obstacles continue to be barriers to care: lack of insurance, not having a home of one's own, trouble paying for transportation, and low income were independently associated with inadequate care; whereas transportation and child care problems were reported by study subjects as the most important obstacles to care. These findings are strengthened by the comparative design of our study: even though case and control patients in the study were drawn from a low-income, inner-city population, and age and parity were controlled, barriers related to poverty still predominated. In a recent study from California,[22] lack of any insurance or MediCal was strongly associated with not receiving prenatal care. Despite recent expansions in MediCal coverage for pregnant women, 11% of women giving birth in California in 1990 had no coverage of any kind.

Studies on barriers to prenatal care were summarized in a 1988 Institute of Medicine report.[18] Financial barriers, lack of awareness of the need for care, poor links to the health care system, and negative attitudes toward health care providers were factors identified in many studies. Poverty, young age, low educational level, and being unmarried were identified as important demographic risk factors. A review of the literature in 1992 confirmed these factors, adding as well the "wantedness"

Table 6. Logistic Regression Analysis of Variables Predicting That a Woman Will Receive Inadequate Prenatal Care

Variable*	Adjusted Odds Ratio (95% CI)	*P* Value
Has no insurance or Medicaid coverage	5.3 (1.2–23.7)	.03
Smokes	3.8 (1.9–7.4)	.001
Does not have own place to live	2.7 (1.2–5.7)	.01
Is black	2.5 (1.3–5.0)	.007
Is not worried about what doctor or nurse might say	2.4 (1.2–4.9)	.02
Has not used contraception for past 2 years	2.1 (1.1–4.1)	.03
Household income is < $400 per month	1.8 (1.0–3.5)	.05
Is afraid or ashamed of pregnancy or seeing doctor	1.4 (1.1–1.8)	.03
Has trouble paying for transportation	1.3 (1.1–1.7)	.02
Has less education	0.8 (0.65–0.98)	.04

**All variables were analyzed as dichotomous variables (no = 0, yes = 1) except for education, which was analyzed as a continuous variable.*

of the pregnancy.[23] Many of these factors were reaffirmed in our study. Clearly, local and state outreach programs for prenatal care have yet to address these factors in a comprehensive fashion. The most striking result of our work is how little has changed since previous studies were completed in the 1980s: economic obstacles, in various forms, continue to prevent women from obtaining adequate prenatal care. Health care reform, as it is currently proposed, can be expected to have minimal impact on these barriers.

Although other studies have suggested that depression[15,16,24] and lack of social support[25] are important contributors to inadequate care, lack of social support did not stand out in our study.

Our study was limited to a single location, but it is clear from the work of others as well[19,20,24–27] that substantial efforts are still needed to overcome concrete barriers related to poverty (ie, lack of medical insurance; inadequate transportation, child care, family planning services, and education; and homelessness).

Our study population was limited to women giving birth at a single large midwestern county hospital, primarily serving inner-city women. Cleveland, with high unemployment, a large African-American population, and areas of concentrated poverty, has features comparable to many other midwestern and eastern cities. However, few Hispanic women, and essentially no Asian, Native American, or recent immigrants were included. Our results, therefore, may not be generalized to these other groups. In addition, our results offer no insights on barriers to access for women living in the rural United States. Because we chose to match subjects according to age and parity, we were not able to study the effects of these variables on adequacy of care.

Lack of belief in the importance of prenatal care has been raised by other studies as an important factor in preventing women from seeking care.[16,26,28] The vast majority of women in our study expressed belief in the importance of prenatal care, whether or not they had received any. This may reflect the effects of prolonged outreach efforts in the Cleveland area; nevertheless, *not* being worried what the physician would say was independently associated with lack of adequate care. Consistent with the Health Belief model,[29] a predisposing factor such as knowledge of the importance of care must be coupled with the belief that the individual is vulnerable and with structural factors (insurance, child care, transportation) for action to result.

The strong association between smoking and late or no prenatal care has been noted previously[15,17] and may mediate some of the effects on infant outcomes seen in this group. Programs designed to focus on providing prenatal care to this group of women would do well to emphasize smoking cessation techniques as part of routine prenatal care. Such programs have been shown to be cost-effective.[30,31] Our data on drug use were based on self-report and are therefore suspect.[32] Because of the lack of uniform screening, we could not rely on toxic screening data. The frequencies reported here represent at best a minimum baseline.

Results of this study suggest that future programs to improve early registration for prenatal care in the inner city will need to be more comprehensive in scope. Expanding Medicaid coverage during pregnancy, although necessary, is not sufficient to bring all women in for care. Rigorous evaluations are needed of prenatal care programs that include providing access to transportation, family planning services, on-site child care, and expanded social services. Such a focus may be more effective than community advertising campaigns, referral hotlines, or isolated attempts at providing social support.

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