Relationships Between Welfare Status, Health Insurance Status, and Health and Medical Care Among Children With Asthma

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Objectives. This study evaluated the relationships between health insurance and welfare status and the health and medical care of children with asthma.

Methods. Parents of children with asthma aged 2 to 12 years were interviewed at 6 urban clinical sites and 2 welfare offices.

Results. Children whose families had applied for but were denied welfare had more asthma symptoms than did children whose families had had no contact with the welfare system. Poorer mental health in parents was associated with more asthma symptoms and higher rates of health care use in their children. Parents of uninsured and transiently insured children identified more barriers to health care than did parents whose children were insured.

Conclusions. Children whose families have applied for welfare and children who are uninsured are at high risk medically and may require additional services to improve health outcomes. (*Am J Public Health.* 2002;92:1446–1452)

Asthma, the most common chronic illness of childhood, affects approximately 6% of US children. Rates of emergency department and outpatient visits for asthma have increased since 1995, whereas rates of hospitalization and death have decreased.[1] Minority children and children from low-income and single-parent families have higher rates of disability due to asthma than do other children.[2] Urban children living in poverty have more exposure to environmental asthma "triggers" and to complex family and social situations. Previous studies have shown that children with Medicaid insurance receive less optimal medical care and use emergency care services more frequently than do other children.[3]

The burden of caring for a chronically ill child is particularly great for families living in poverty. Since the passage of the Personal Responsibility and Work Opportunity Reconciliation Act in 1996, welfare rolls have declined rapidly. Many women who leave welfare also lose health insurance for themselves and their children and enter jobs that do not provide health insurance.[4] Temporary Assistance for Needy Families (TANF) and Medicaid are now administered as separate programs; many children remain eligible for Medicaid after their families leave TANF. However, recent large declines in Medicaid enrollment among TANF recipients have not been accompanied by equally large increases in Medicaid enrollment among non-TANF recipients.[5] TANF recipients are poorer, less educated, and less healthy in comparison with poor mothers who have never received welfare, and they have higher rates of depression.[6]

We hypothesized that chronically ill children of welfare recipients would have poorer health outcomes than similar children of nonrecipients and that children who are uninsured or transiently insured would have poorer health outcomes than those who are insured continuously. The purpose of this study was to evaluate the relationships between health insurance status and welfare status and the health and medical care of children with asthma.

METHODS

We report baseline cross-sectional questionnaire data from 386 children with asthma who were enrolled in a study of chronically ill children and their mothers (for a detailed description of the study design, see the Romero et al.[7] article on page xxxx of this issue). During 2001, trained interviewers approached 504 primary caretakers of chronically ill children aged 2 to 12 years at one of 8 clinical sites or 2 welfare offices in San Antonio, Tex. Clinical sites included a county-operated pediatric acute care clinic, the inpatient ward of a children's hospital, a private pediatric practice office, a general pediatrics appointment clinic, a pediatric walk-in clinic, and 3 pediatric specialty clinics (hematology, endocrinology, and pulmonology).

After obtaining informed consent, the interviewers administered a structured, precoded survey in either English or Spanish, according to respondent preference. Three hundred ninety-five (78.4%) of the study children had asthma, and 386 caretakers of children with asthma completed the Asthma Supplement (described below).

Questionnaires

We developed the study questionnaire with questions adapted from previous studies as well as from scales validated previously. The English-language questionnaire was translated into Spanish by a native speaker and then reviewed for equivalency of content by several bilingual native speakers. The questionnaire was pilot-tested in a similar population before participants were enrolled.

The Asthma Supplement consisted of 22 additional questions about asthma symptoms, health care use, and medical care taken from questionnaires used in previous asthma studies.[8,9] The Asthma Supplement also included the Rosier Asthma Functional Severity Scale.[10]

Variables and Scales

Welfare status was defined as having had no contact with the welfare system (had

never received or applied for TANF benefits), denied (had applied for TANF and been denied benefits), pending (had a pending application), former (had received TANF benefits in the past), or current (currently receiving TANF benefits). Health insurance status was categorized as follows: (1) no gaps in health insurance in the past year ("continuously insured"), (2) gaps in the past year ("transiently insured"), or (3) no health insurance during the past year ("uninsured").

We used the 5-item Mental Health scale from the SF-36 Health Survey to assess respondents' mental health.[11] Total transformed scores have a potential range of 0 to 100, with higher scores indicating better mental health.[11] Both English and Spanish versions have acceptable reliability.[12,13] Scores correlate with other health status measures and have been shown to be lower among individuals with self-reported medical illness than among those who do not report illness.[13]

We used responses to questions about usual frequency of daytime and nighttime symptoms to determine asthma severity (mild intermittent, mild persistent, moderate persistent, or severe persistent); severity categorizations were based on the 1997 *Guidelines for the Diagnosis and Management of Asthma.*[14] A "severe episode" is characterized by loss of consciousness, seizures, admission to an intensive care unit, or artificial respiration.

The Rosier Asthma Functional Severity Scale[10] is a 6-item questionnaire that measures functional severity over the previous year. Scores can range from 0 to 24, and higher scores represent more asthma symptoms. The scale has been shown to correlate significantly with school absence, functional impairment, and medication use. Both English- and Spanish-language versions were used in a previous pilot study.[15]

Respondents were asked to report the total number of acute care visits for asthma in the previous year. Emergency department visits and inpatient hospitalizations during the previous 6 months were dichotomized ("any" vs "none").

Parents were asked whether, in caring for their child's asthma, they experienced problems with transportation, appointment times, paying for visits or medicines, administering medicines at school, or obtaining or paying for special equipment. These questions were based on items from previous questionnaires developed by the authors,[8] and potential total barriers scores ranged from 0 to 7.

Five questions based on current asthma management guidelines[14] were used to evaluate quality of medical care. These questions focused on (1) receipt of influenza immunization, (2) use of anti-inflammatory medicine, (3) possession of a spacer (a holding chamber used to administer asthma medications), (4) possession of a peak flow meter (used to measure lung function), and (5) presence of a written plan on how to treat asthma symptoms. The questions were also used to derive a total score; potential total quality-of-care scores ranged from 0 to 5 for children 6 years and older and from 0 to 4 for children younger than 6 years (the question regarding possession of a peak flow meter was omitted for younger children).

Statistical Analyses

Descriptive statistics were calculated for sociodemographic variables. Analyses of variance or χ^2 tests were used in calculating simple associations of some of the sociodemographic variables with welfare status and insurance status. Raw means and standard deviations for continuous measures and frequencies for categorical measures were then calculated by welfare status group, insurance status group, and mental health score tertiles. Logistic regression was used in analyzing associations of quality-of-care indicators with sociodemographic factors, and overall quality-of-care scores were examined via analysis of covariance.

We used linear regression to examine the associations of welfare status, health insurance status, parent mental health score (SF-36), total barriers to care, quality-of-care score, and sociodemographic variables with Rosier Asthma Functional Severity Scale total score. Poisson regression models were used to analyze the associations of these variables with number of acute care visits per year. In each of these analyses, the sociodemographic variables were child age, parent education (less than high school, high school or more), race/ethnicity (non-Hispanic White, Black, Hispanic, other), parent birthplace (United States, other), and marital status (single, married, single living with partner).

In the regression models, the categorical variables welfare status, insurance status, parent education, race/ethnicity, parent birthplace, and marital status were coded as dummy variables. Because the quality-of-care variable was calculated differently for those younger than 6 years and those 6 years or older, 2 separate variables were created: 1 for the younger group (equal to the appropriate quality-of-care score for a child younger than 6 years and zero otherwise) and 1 for the older group (equal to the appropriate quality-of-care score for a child 6 years or older and zero otherwise).

The estimated coefficients for the linear regression model represented differences in mean Rosier Asthma Functional Severity Scale scores (1) after comparison of each variable with the reference category (in the case of categorical variables) or (2) given a 1-unit change in the continuous variables. For the Poisson regression models, we report incidence rate ratios (the relative incidence rates of outcomes after comparison of each variable with its reference group for categorical variables or relative to a 1-unit increase in the continuous variables). Statistical significance for regression coefficients was set at $P<.05$. Analyses were conducted with the Stata statistical package, version 7 (College Station, Tex).

RESULTS

Table 1 describes the study population. The majority of children were male, and half were younger than 6 years. Those who had no welfare experience were the largest of the welfare status groups, followed by former and current recipients.

More than 40% of children lacked health insurance for part or all of the previous year. Three hundred five (79.2%) children had health insurance at the time of enrollment: 223 (73.1%) had Medicaid, 40 (13.1%) were covered by the Child Health Insurance Program, 40 (13.1%) had private insurance through their parents' work, and 2 had private insurance purchased by their parents. TANF status was significantly associated with insurance status ($\chi^2_8=20.13$,

TABLE 1—Sociodemographic Characteristics of Families of Children With Asthma

	Sample
Child age, y, mean (SD)	6.0 (3.2)
Range	2–12
Parent age, y, mean (SD)	30.3 (7.4)
Range	16–72
No. of household members, mean (SD)	4.7 (1.9)
Range	1–15
Parental mental health (SF-36) score, mean (SD)	61.0 (23.9)
Range	0–100
Enrollment site, No. (%)	
Pediatric acute care clinic	18 (4.7)
Children's hospital, inpatient	22 (5.8)
Pediatric appointment clinic	35 (9.2)
Pediatric walk-in clinic	35 (9.2)
Pediatric specialty clinic	1 (0.3)
Private pediatric practice office	39 (10.2)
TANF office	232 (60.7)
Respondent, No. (%)	
Mother	359 (93)
Father	13 (3.4)
Grandparent	11 (2.9)
Guardian/other relative	3 (0.8)
Welfare status, No. (%)	
Nonrecipient	168 (43.5)
Denied	34 (8.8)
Pending	36 (9.3)
Former	95 (24.6)
Current	53 (13.7)
Insurance status, No. (%)	
Always insured	221 (57.3)
Transiently insured	144 (37.3)
Never insured	21 (5.4)
Child gender male, No. (%)	217 (56.2)
Race/ethnicity, No. (%)	
Hispanic	247 (65.2)
Black	89 (23.5)
Non-Hispanic White	27 (7)
Other	16 (4.2)
Language, No. (%)	
English	285 (73.8)
Spanish	44 (11.4)
Both	57 (14.8)
Parent education less than high school, No. (%)	145 (37.7)
US-born parent, No. (%)	339 (87.8)
Household income less than $18 000/y, No. (%)	290 (75.9)
Marital status, No. (%)	
Married	130 (33.8)
Single	191 (49.6)
Single with partner	64 (16.6)

P=.01). Forty-two (79%) current recipients had no gaps in health insurance. In contrast, only 14 (38.9%) pending applicants had no gaps in health insurance; 11.1% had no health insurance during the past year, and 50% were "transiently insured." The insurance status of those who had never had contact with the welfare system, those who had been denied benefits, and former recipients reflected that of the study population overall.

Most of the children (n=224; 62.9%) had moderate to severe persistent asthma; 47 children (13.2%) had mild intermittent asthma, and 85 (23.9%) had mild persistent asthma. The mean Rosier Asthma Functional Severity Scale score (10.7) was considered to be within the range indicating "moderate symptom severity."[10]

The mean mental health score for parents was 61.0 (SD=23.9, range=0–100), which was lower than scores reported previously for adults with long-standing medical illnesses.[13] An analysis of variance showed that TANF status was significantly associated with mental health score (P<.0001). Those with no welfare experience had significantly higher (better) mental health scores in comparison with current recipients (score difference=10.5; 95% confidence interval [CI]=0.2, 20.8) and pending applicants (score difference=18.2; 95% CI=6.5, 30.0).

Table 2 shows descriptive statistics for health status variables and barriers to care, by TANF status, insurance status, and parent mental health, allowing examination of patterns in the data without formal statistical testing. Those with no welfare experience appeared to have fewer symptoms and lower rates of severe asthma episodes compared with respondents who had had some contact with the welfare system. Health care use did not differ substantially among the TANF groups.

Children who had no gaps in health insurance exhibited, on average, fewer barriers to care than did those with no health insurance during the previous year and those who were transiently insured. Children of parents with poorer mental health scores (lowest tertile) had a pattern of more asthma symptoms, more acute care visits, more barriers to care, more severe asthma episodes, and higher rates of health care use than did children of parents with better mental health scores.

Although the majority of children in this study had moderate to severe persistent asthma, most were not receiving medical care that met current guidelines (Table 3). Older children were more likely than younger children to have a spacer and a peak flow meter. Children of married parents were also more likely to have a spacer. Children of high school graduates were more likely to receive anti-inflammatory medicines. No variables were related significantly to total quality-of-care score.

Table 4 presents the results of the multivariate regression models focusing on asthma symptoms and number of acute care visits. Those who had been denied TANF had more asthma symptoms than did those without TANF experience. Lower (poorer) parent mental health scores were associated with increases in reported symptoms. Higher numbers of reported barriers to care were also associated with increases in asthma symptoms. Among children younger than 6 years, higher quality-of-care scores were associated with higher symptom scores.

Those who had been denied TANF had a 41% greater adjusted incidence rate of acute care visits than did nonrecipients. Those who had no insurance reported fewer acute care visits than did those who had always been insured. Better mental health scores were associated with decreases in acute care visits; more barriers to care were associated with increases in such visits. Higher quality-of-care scores were associated with greater numbers of acute care visits. Older children had fewer acute care visits than did younger children. Race/ethnicity was related to acute care visits in a variable pattern. The incidence rate of acute care visits among children of foreign-born mothers was 55% that of children of US-born mothers.

DISCUSSION

This study contributes important information about the relationships between welfare status, insurance status, parent mental health, demographic variables, and the health and medical care of children with asthma. Parents who had been denied TANF

TABLE 2—Means for Asthma Health Variables and Barriers to Care, by Welfare, Insurance, and Parent Mental Health Status

	Symptom Score (Rosier), Mean (SE)	Acute Visits per Year, Mean No. (SE)	School Absences, Mean No. (SE)	Barriers, Mean No. (SE)	Severe Episode, %	Emergency Department Visit in Past 6 Months, %	Hospitalization in Past 6 Months, %
All	10.7 (5.7)	3.6 (5.3)	8.3 (13.0)	1.3 (1.5)	30.6	59.1	22.5
Welfare status							
Nonrecipient	9.3 (5.5)	3.4 (5.5)	7.4 (12.3)	1.2 (1.4)	20.2	56.6	20.2
Denied	13.2 (6.1)	5.2 (7.9)	10.8 (14.7)	1.6 (1.8)	42.4	67.7	29.4
Pending	12.6 (5.4)	3.8 (6.0)	9.4 (13.4)	1.6 (1.5)	47.2	58.3	13.9
Former	11.1 (5.2)	3.4 (3.7)	5.6 (5.7)	1.3 (1.6)	34.7	56.8	24.2
Current	11.5 (5.6)	3.4 (4.2)	14.4 (20.8)	1.0 (1.3)	37.7	66.0	28.3
Insurance							
Always	10.5 (5.8)	3.6 (5.2)	9.3 (15.0)	1.0 (1.3)	27.7	59.2	23.5
Transient	11.1 (5.4)	3.9 (5.7)	7.1 (9.9)	1.6 (1.6)	36.1	59.7	22.9
None	9.7 (5.6)	1.8 (1.5)	5.8 (7.5)	2.0 (1.8)	23.8	52.4	9.5
Mental health							
Lowest tertile	12.2 (5.4)	4.6 (6.8)	8 (11.1)	1.7 (1.7)	38.5	67.2	26.2
Middle tertile	11.3 (5.3)	3.8 (4.6)	9.9 (14.5)	1.2 (1.4)	32.2	63.6	25.6
Highest tertile	8.8 (5.7)	2.7 (4.1)	6.8 (12.3)	0.9 (1.3)	22.6	47.8	15.9

TABLE 3—Components of Quality of Medical Care for Children With Asthma

	Sample	Predictor(s)[a]
Influenza immunization in present year, No. (%)	73 (26.6)	Race ($P < .05$)
Influenza immunization in past, No. (%)	175 (46.5)	
Anti-inflammatory prescribed, No. (%)	102 (27.4)	Parent education ($P < .01$)
Have spacer, No. (%)	171 (44.7)	Age ($P < .001$)
		Married parent ($P = .01$)
Have written plan, No. (%)	215 (57.5)	
Have peak flow meter,[b] No. (%)	89 (46.4)	Age ($P < .0001$)
Quality of care score, mean (SD; range)		
< 6 years old (n = 193)	1.61 (1.1; 0–4)	
≥ 6 years old (n = 193)	2.28 (1.4; 0–5)	

[a]Based on logistic regression for each specific medical care variable. Independent variables included Temporary Assistance for Needy Families, insurance, child age, parent education, race, parental birthplace, and marital status.
[b]Peak flow meter evaluated for children ≥ 6 years old. Quality of care score for children < 6 years old excludes peak flow meter variable.

reported more severe asthma symptoms in their children and more acute care visits than did parents without TANF experience, even after other variables had been controlled. Children of recent TANF applicants were most likely to be uninsured or transiently insured, and their parents had the poorest mental health scores. Our findings suggest that chronically ill children whose families have contact with the welfare system are a high-risk group and point to the importance of access to health insurance and medical and mental health services for such families.

Noninsured children had fewer acute care visits and more barriers to asthma care than did children who had always been insured. Previous studies have shown that impoverished and minority families experience many barriers to care, including transportation difficulties, language and cultural obstacles, problems with asthma care for their child at school, and difficulties in gaining access to specialist services.[16–18]

The strong association between health insurance coverage and TANF status in this study points to the traditional linking of these services. A recent study showed that 30% of women who had left welfare had children who had not been insured during the previous month, as compared with 7% of women still on welfare.[19] Thus, families who lose welfare benefits are particularly vulnerable to loss of health insurance and should be helped to find resources to care for their chronically ill children.

Parent mental health was strongly associated with reported severity of asthma symptoms and use of health care services. Several studies have noted high rates of mental health problems in welfare recipients relative to published values for a national sample[19] and to other poor women.[6] In comparison with nonrecipient single mothers, welfare recipients are 35% more likely to have psychiatric disorders.[20] A recent review noted that a median of 22% of welfare recipients met diagnostic criteria for a major depressive disorder and that 44.5% reported depressive symptoms.[21]

The relationship between parent mental health and child health outcomes is complex.

TABLE 4—Multivariate Analysis of Association of Welfare Status, Insurance Status, and Parent Mental Health With Health Outcomes

	Asthma Symptom Score (Rosier)			Acute Visits per Year		
	Coefficient	SE	*P*	Incident Rate Ratio	SE	*P*
Welfare status						
Nonrecipient (reference)	0.00			1.00		
Denied	2.90	1.06	.007	1.41	0.13	<.001
Pending	1.38	1.11	.21	0.94	0.10	.57
Former	0.62	0.76	.41	0.95	0.07	.48
Current	1.15	0.96	.23	1.03	0.10	.76
Insurance						
Always (reference)	0.00			1.00		
Transient	–0.07	0.63	.91	1.00	0.06	.98
None	–0.48	1.32	.72	0.62	0.11	.006
Parental mental health	–0.04	0.01	.002	0.99	0.001	<.001
Barriers to health care	0.51	0.21	.01	1.08	0.02	<.001
Quality of health care score						
Children <6 yrs	0.82	0.35	.02	1.18	0.04	<.001
Children ≥6 yrs	0.25	0.27	.35	1.23	0.03	<.001
Child age	0.16	0.14	.27	0.95	0.01	.001
Parent education						
Less than high school education (reference)	0.00			1.00		
High school or more	0.22	0.61	.72	1.03	0.06	.64
Race/ethnicity						
Hispanic (reference)	0.00			1.00		
Black	0.92	0.75	.22	0.85	0.06	.02
Non-Hispanic White	–1.34	1.13	.23	0.54	0.07	<.001
Other	2.06	1.41	.15	1.34	0.15	.01
Parental birthplace						
US (reference)	0.00			1.00		
Other	–1.18	0.91	.19	0.55	0.06	<.001
Marital status						
Married (reference)	0.00			1.00		
Single	0.15	0.69	.82	0.90	0.06	.12
Single with partner	0.45	0.89	.61	1.16	0.09	.08

Parents of chronically ill children are exposed to the daily stress and uncertainty of caring for their children and may be more likely to become depressed. Parent mental health can affect perceptions of child health, and depressed or anxious parents may overuse emergency services. Jessop et al. found that maternal mental health was correlated with the reported functional status of children with asthma and with impact of the illness on the family.[22] Recently, several investigators have noted high levels of psychological distress in impoverished mothers of children with asthma and have shown that poorer mental health is associated with a higher risk of subsequent hospitalizations and an increased use of emergency department services.[23–25]

Clinicians should be aware of the high potential for depression and other mental health problems among impoverished parents of chronically ill children and of the impact of these mental health issues on use of health care services. Simple, sensitive screening tools might improve identification of high-risk families at both clinical and social services sites. Furthermore, interventions designed for children with asthma must recognize and address these important mental health issues if they are to produce health improvements.[26]

As have previous studies, this study showed that the quality of medical care for impoverished children with asthma was poor. The surprising finding that higher quality-of-care scores were associated with more asthma symptoms and more acute-care visits warrants further exploration. Sicker children may have more opportunities to interact with health care providers and to obtain prescriptions for recommended medications and equipment than do children who are less ill.

Self-reported rates of anti-inflammatory medication use in our study were lower than those reported previously in a Medicaid population; rates of influenza vaccine administration and peak flow meter use were comparable.[27] One study showed that Medicaid-insured children with asthma were as likely as those without Medicaid insurance to have a controller medicine prescribed but were less likely to have a controller medicine dispensed.[3] Thus, impoverished children with asthma may be disadvantaged in terms of the quality of medical care available to them and may have difficulty following through with recommendations even when medical care is adequate.

Our study involved several limitations. Because the data were cross sectional, we cannot make statements about the direction of the relationships between welfare status, health insurance, and parent mental health and physical health. This study was conducted in a single geographic area, and the findings may not be applicable to other parts of the United States owing to differences in social and health care services, culture, language, or other unmeasured demographic and social variables. Finally, our findings were based on self-reports of asthma symptoms, health care use, and quality of medical care. However, previous studies have revealed a close relationship between self-reported asthma morbidity and objective data obtained directly from hospital databases and school records.[9]

Children with asthma whose families have contact with the welfare system or who are uninsured or transiently insured are at medically high risk. Our results showed that impoverished parents of children with asthma have poor mental health scores and that poor mental health status in parents is associated with more asthma symptoms and higher rates of health care use in children. Such families may require a variety of additional services, including mental health services, to improve asthma health outcomes. Further work must be done to improve the quality of medical care received by impoverished children with asthma and to reduce barriers to care. If they are to be effective, interventions must provide necessary resources and promote the development of skills and behaviors needed to care for chronically ill children. ■

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This work was approved by the institutional review boards at Boston University Medical Center, the Columbia University School of Public Health, the University of Texas Health Science Center, and CHRISTUS Santa Rosa Hospital. All participants consented to be interviewed.

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