

# Maltreatment of Children Born to Women Who Used Cocaine During Pregnancy: A Population-based Study

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**ABSTRACT.** *Background.* Previous studies of maltreatment of children born to women who used cocaine during pregnancy have relied on either selected samples of infants identified at birth or biased, high-risk samples referred to protective services.

*Objective.* To determine the relative risk of either maltreatment or placement outside the home during the first 2 years of life in children born to women who used cocaine during pregnancy compared with a sociodemographically similar comparison group.

*Patients.* We reviewed the medical records of consecutive deliveries at Yale-New Haven Hospital from August 1, 1989 through September 30, 1990. Of the 1140 women who were eligible for the study, 173 had a positive history and/or a positive urine test for cocaine; 139 of the infants were included in the study. A comparison group of infants was chosen from 526 women whose obstetric records indicated that they had not used cocaine during pregnancy based on at least two separate notations in the record. For each of the 139 cocaine-exposed infants, an infant was chosen from the comparison group based on seven matching characteristics: date of birth, race, method of payment for the hospitalization, gestational age, mother's parity, mother's age at delivery, and timing of the first prenatal visit.

*Main Outcome Measures.* Children's medical records at the only two hospitals in the region, the two neighborhood health centers, and the only health maintenance organization were reviewed from birth to 2 years of age. Each injury was classified by two independent reviewers who used predefined criteria to distinguish maltreatment (physical abuse, neglect, or abandonment) from unintentional injuries. Placements outside the home were categorized according to whether the placement was in foster care or with a relative.

*Main Results.* The children were mainly African-Americans (80%), and most were enrolled in Medicaid (96.5%). By 2 years of age, 9.3% of the infants in the cocaine-exposed group versus 1.4% in the comparison group had been maltreated [matched relative risk = 6.5; 95% confidence interval (CI) = 1.47, 28.80], and 25.9% vs 8.6% had spent some time in placement (matched relative risk = 5.0; 95% CI = 2.08, 12.01). After controlling for differences between the groups in baseline clinical and social variables, the adjusted odds ratios for both mal-

treatment (3.98; 95% CI = .81, 22.80) and placement (1.66; 95% CI = .74, 17.83) decreased and were no longer statistically significant.

*Conclusion.* In this population-based study, children born to women who used cocaine during pregnancy were at a substantially increased risk of maltreatment or placement outside the home compared with a sociodemographically similar comparison group. Differences in baseline variables between the two groups, however, partially accounted for this increased risk. Therefore, a mother's use of cocaine is more likely a marker of increased risk rather than a single explanatory variable. *Pediatrics* 1997;100(2). URL: <http://www.pediatrics.org/cgi/content/full/100/2/e7>; *child maltreatment; child abuse; neglect; cocaine; risk factors.*

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ABBREVIATIONS. RR, relative risk; CI, confidence interval.

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**A**buse of cocaine and crack cocaine continues to be a major problem in the United States; recent surveys indicate that as many as 15% to 20% of inner-city women have used cocaine during their pregnancies.<sup>1</sup> Throughout the last several years, a major focus of clinicians and researchers concerned with infants born to such women has been the biological effects of in utero exposure to cocaine on the developing fetus.<sup>2</sup> Recently, attention also has been directed toward the adverse effects of a mother's use of cocaine on the child's nurturing environment. Studies show that mothers who use cocaine have difficulties interacting with their infants, in particular, demonstrating more intrusive and hostile behaviors toward their infants.<sup>3,4</sup> In addition, children of mothers who use cocaine are at an increased risk of more serious forms of parental dysfunction, such as maltreatment, and of placement in foster care.<sup>5-9</sup>

Questions about the methodology of these studies, however, have been raised. Studies have either failed to use a control group or selected controls that were not comparable to the cocaine-exposed children on important sociodemographic characteristics. In some studies, selection bias may have occurred because of preferentially including socially high-risk mothers who used cocaine. Problems also have occurred in the ascertainment of the outcome. Infants labeled as at-risk because they were born to mothers who used cocaine have been included in reports of maltreatment, and investigators have failed to consider the problem of detection bias, which may occur if clinicians are more likely to report to protective services a child's injuries because the parents are known sub-

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stance abusers compared with identical injuries in children of nonsubstance abusers.<sup>10</sup> Finally, studies have failed to consider the importance of confounding psychosocial variables<sup>11</sup> when examining the association of maternal cocaine use and maltreatment; the use of cocaine, therefore, may be a marker for these psychosocial variables rather than a direct cause of the maltreatment.

To address these methodological issues, we conducted the following study to determine the relative risk (RR) of maltreatment or placement outside the home during the first 2 years of life in children born to women who used cocaine compared with a socio-demographically similar comparison group. In this study, we used a population-based approach to select the subjects, specific criteria to define types of maltreatment, an investigator who was blind to whether the mother used cocaine when classifying injuries as maltreatment or as unintentional injuries, and logistic regression analyses to adjust for potential confounders.

## METHODS

### Selection of Mothers

We reviewed the medical records of all women who lived in either New Haven or one of two adjacent towns, gave birth at Yale-New Haven Hospital from August 1, 1989, through September 30, 1990, and were eligible to receive prenatal care at the Women's Center of the hospital. Women were excluded if they: 1) were less than 18 years of age at the time of delivery, 2) were using heroin or methadone during pregnancy, 3) had a fetal death or an infant who died within 48 hours of birth, or 4) delivered twins or triplets.

Based on a review of the prenatal and obstetric records, we identified two groups of potential subjects. Group 1 used cocaine during pregnancy, based on either historical data noted in the records and/or a positive urine screen for cocaine; group 2 had no history of cocaine use during pregnancy, based on at least two separate notations in the mother's record. This criterion was used for group 2 to decrease the likelihood that women who used cocaine might be misclassified and included in this comparison group.

### Selection of Children

Children were eligible if they received their pediatric care at Yale-New Haven Hospital or at one of four additional sites—the only other hospital in the greater New Haven area, either of the two neighborhood health centers in New Haven, or the only health maintenance organization in the area. We excluded children who either were discharged directly to foster care and spent no time during the first 2 years of life with their biological families or were adopted at birth.

Children born to mothers in group 1 became the cocaine-exposed (or index) group. Comparison children were selected from group 2 and matched with the cocaine group on: 1) date of birth within 6 months; 2) race; 3) method of payment for the hospitalization as an approximate indicator of socioeconomic status; 4) gestational age and birth weight (at least 37 weeks by physical examination versus less than 37 weeks by physical examination and, within this category, a birth weight of <1500 g or ≥1500 g); 5) the mother's parity (primiparous or not); 6) the mother's age at delivery (18 years, 19 to 24 years, or 25 years or greater); and 7) the timing of the first prenatal visit (before 28 weeks of gestation versus 28 weeks or after). When perfect matches could not be found, we relaxed the matching criteria in the following order: maternal age, parity, date of birth of the comparison child compared with the index child, timing of prenatal care, and, finally, race. We were able to identify perfect matches for 51% of the index children, and 95% were matched on at least five of the seven matching variables.

## Determination of Outcomes

From the medical records, we abstracted information about all visits to the monitored health care sites. Each injury (eg, a bruise or an ingestion) or visit for suspected maltreatment (eg, a child brought to the hospital because of being found alone in an apartment) that was recorded in the record was classified by two investigators into one of the following categories (modified from previous studies<sup>12-13</sup>):

1. Physical abuse—an incident for which the information indicated a definite or probable act of commission that resulted in harm to the child.
2. Neglect—an incident or injury that resulted from a complete lack of parental supervision or attention; a lack of food, shelter, or clothing; a serious health problem that resulted from or persisted because of failure to receive appropriate medical care. Delays in immunizations were not included in this last category.
3. Sexual abuse—an incident that indicated a definite or probable sexual act performed on a child.
4. Abandonment—a history that the primary caretaker left the child in the care of another adult but failed (usually after a few days) to return to care for the child.
5. Unintentional injury-neglect—an injury that might have been prevented by more adequate parenting but did not represent a complete lack of parental supervision (eg, a soft tissue injury that occurred when a 6-month-old infant fell off a bed).
6. Unintentional injury—an injury that was unlikely to be prevented by reasonable parental supervision.
7. Household or neighborhood violence—an injury to the child that occurred because of violence that did not seem to be directed at the child and occurred in the home or neighborhood.
8. Insufficient information for classification—an incident for which there was insufficient information in the medical record to allow a classification.

Maltreatment was defined as the occurrence of physical abuse, sexual abuse, neglect, or abandonment.

We classified each event using a two-investigator approach described previously.<sup>12-13</sup> One investigator (B.W.C.F.) used the full information abstracted from the medical records, whereas a second investigator (J.M.L.) made an independent rating based on a summary of the event and the child's age, but no information about whether the child was in the cocaine group or about who brought the child to the medical visit. When disagreements occurred, the event was discussed and the two raters agreed upon a consensus rating. Agreement occurred in 88% of the events, and in 93% when the disagreements between categories 5 and 6, which were considered minor, were not counted.

The second outcome, a change in the child's primary caretaker as noted in the medical records, was categorized based on two variables: 1) whether the placement was with a relative or in foster care, and 2) whether or not protective services personnel were involved with arranging the placement. We also recorded the reasons for placement so we could determine, for instance, whether placement occurred because the mother entered an inpatient drug treatment program.

### Collection of Other Data

For each child, we recorded the health care facility, the reason for each visit, and the diagnoses. In addition, we abstracted information about the pregnancy and perinatal period. For the mother, this information included age at delivery, type of delivery, gravidity, parity, use of alcohol or tobacco, timing of first prenatal visit, and the clinicians' concerns about the care provided to previous children or the adequacy of the mother's housing situation. For the child, we abstracted information about gestational age, birth weight, Apgar scores, neonatal complications, and duration of hospitalization.

### Statistical Analysis

We used the  $\chi^2$  statistic or *t* test to analyze differences in baseline characteristics. The association between cocaine use during pregnancy and each outcome was determined by calculating matched risk ratios (RR) and the associated 95% confidence intervals (CI).<sup>14</sup> We also used logistic regression with multiple covari-

ates to calculate an adjusted odds ratio after controlling for baseline variables that were associated with the occurrence of the outcome.<sup>15</sup> The odds ratio was used as an estimate of the RR<sup>16</sup> Because follow-up information was available for both groups at similar rates during the first 2 years of the child's life, life table analyses are not presented.

## RESULTS

Based on a review of 1214 consecutive obstetric records, 1140 pregnant women were eligible for the study. Of these, 173 (15%) were eligible to be in the cocaine-using group, 526 (46%) were eligible to be in the comparison group, and the remaining 441 (39%) had less than two notations in the mother's record and were considered ineligible. Of the 173 mothers who were positive for cocaine, 139 of their infants were included in the study; the remaining infants were excluded for the following reasons: 21 did not receive their pediatric care at the monitored health care sites, 7 were discharged to foster care and spent no time with their biological mothers, 5 had information only about the postpartum period in the records and there was no information at the five health care sites, and 1 record could not be located. For each of the 139 cocaine-exposed infants a matched infant was chosen from the comparison group.

As noted in Table 1, which shows the matched characteristics of the mothers and infants, the two groups were similar, except that mothers in the cocaine-using group more often were at least 25 years of age at the time of delivery and less often initiated prenatal care before 28 weeks of gestation. There were substantial differences in the nonmatched characteristics of the mothers, but not of the infants (Table 2). The mothers were more likely to have no prenatal care, to have the use of alcohol or tobacco reported in the record, and to have had a previous child who was maltreated or placed out of the home for some period of time. In addition, clinicians more often noted a concern about housing in the records of the mothers who used cocaine. These variables were subsequently used in the logistic regression analyses to adjust for differences between the two groups.

There were no substantial differences between the two groups in the number of visits to the monitored health care sites during the first 2 years of life (mean of 17.3 visits in the index group versus 16.8 in the comparison group). Also, the two groups were similar in terms of the timing of the last visit recorded in

**TABLE 1.** Matched Characteristics of Sample

	% of Cocaine Group (N = 139)	% of Comparison Group (N = 139)	P
African-American	82	78	NS
Medicaid	97	96	NS
≥25 years at delivery	70	51	.001
Prenatal care <28 weeks of gestation	59	74	.009
Primiparous	10	12	NS
Gestational age <37 weeks	23	23	NS
Mean gestational age (wk)	38.2	38.3	NS
Mean birth weight (g)	2,760	2,911	NS

**TABLE 2.** Nonmatched Perinatal Characteristics of Sample

	% of Cocaine Group (N = 139)	% of Comparison Group (N = 139)	P
<b>Mothers</b>			
No prenatal care	17	4	.001
Alcohol use	44	15	<.001
Tobacco use	70	34	<.001
Maltreatment or placement of previous child	34	7	<.001
Clinician's concern about housing	23	5	<.001
<b>Newborn</b>			
Male	49	53	NS
5-minute Apgar <8	7	4	NS
>1 day in NICU*	17	21	NS

\* NICU, neonatal intensive care unit.

**TABLE 3.** Percentage of Children With Documented Visits at or Beyond Listed Age

Age (mo)	% of Cocaine Group	% of Comparison Group
6	91	93
12	91	89
18	88	86
24	82	76

the medical records. As noted in Table 3, data were available on similar numbers of subjects in each group during the first 2 years of life.

Table 4 shows the injury events that occurred in the cocaine-exposed and comparison groups. The two groups were comparable in the total number of events in each group (mean of .55 events per child in the index group versus .52 in the comparison). Maltreatment occurred more frequently in the index group (9.3%) versus the comparison group (1.4%), and the matched RR was 6.5; 95% CI = 1.47, 28.80. No episodes of sexual abuse were identified. The majority of the episodes of maltreatment occurred before the first birthday: 13 (81%) of 16 episodes in the cocaine group and 1 of 2 episodes in the comparison group. When specific types of maltreatment were examined, neglect occurred significantly more frequently in the cocaine-exposed group (matched RR = 9.0; 95% CI = 1.14, 71.04). In contrast, the matched RRs for the injuries categorized as unintentional-neglect or unintentional were close to one indicating that there were no substantial differences between the two groups.

Table 5 shows the placements in the two groups. Of the cocaine-exposed infants, 25.9% were placed with a relative or in foster care by the child's second birthday compared with 8.6% in the comparison group (matched RR = 5.0; 95% CI = 2.08, 12.01). The majority of the placements in both groups were with relatives; although the RR for placement in foster care was 3.3, this was not statistically significant. Of the 36 children in the cocaine-exposed group who were placed outside the home, 50% were placed on more than one occasion; in the comparison group, of the 12 children who were placed, 42% were placed on more than one occasion. The child protective ser-

**TABLE 4.** Outcomes in Cocaine-exposed and Comparison Children

Classification of Injury	Number of Events		% of Children		Matched RR	95% CI
	Cocaine	Comparison	Cocaine	Comparison		
Maltreatment	16	2	9.3	1.4	6.5	1.47, 28.80
Abuse	1	0	0.7	0	—	—
Neglect	11	1	6.5	0.7	9.0	1.14, 71.04
Abandonment	4	1	2.9	0.7	4.0	0.45, 35.39
Unintentional injury-neglect	26	27	18.0	18.0	1.0	0.54, 1.86
Unintentional injury	28	35	18.7	20.1	0.9	0.50, 1.67
Household violence	2	3	0.7	2.2	0.3	0.03, 3.20
Insufficient information	5	5	3.6	3.6	1.0	0.29, 3.45
Total	77	72				

**TABLE 5.** Placements in Cocaine-exposed and Comparison Children

Type of Placement	Number of Placements		% of Children		Matched RR	95% CI
	Cocaine	Comparison	Cocaine	Comparison		
Any	59	17	25.9	8.6	5.0	2.08, 12.01
Foster care	11	5	7.9	2.9	3.3	0.92, 12.10
Relative	48	12	20.9	7.2	4.2	1.71, 10.16

vice agency was involved with 36% of the total episodes of placement (35% of the episodes in the cocaine group and 41% in the comparison group), whereas the remaining placements were arranged within families on a less formal basis.

In the cocaine-exposed group, the major reasons for each child's placement were maltreatment (33%), the mother's admission for inpatient drug rehabilitation (14%), the mother's unavailability because of problems, such as a psychiatric hospitalization or incarceration (8%), either an unsafe home or homelessness (8%), or other reasons (14%). Insufficient information was available in the records to determine the reasons in 22% of the cocaine group's placements. In the comparison group, the major reasons for each child's placement were: either maltreatment or a question of maltreatment (25%), an unsafe home (33%), or a mother with serious emotional problems (8%). No clear reason was noted in the record of 33% of the children in this group. In both groups, all but two of the placements in foster care were because the child had been maltreated.

To control for potential confounders, we calculated adjusted odds ratios using logistic regression analyses. We entered into the statistical model those independent variables that were associated with the outcome in the bivariate analyses: lack of prenatal care, clinicians' concerns about housing, either maltreatment or placement of an older sibling, use of alcohol, use of tobacco, and greater than 1 day spent in the neonatal intensive care unit.

For the outcome of maltreatment, the adjusted odds ratio was 3.98 (95% CI = .81, 22.80) after controlling for the two variables that remained in the model—lack of prenatal care and clinicians' concerns about housing. This adjusted odds ratio, which was not statistically significant, was decreased compared with the unadjusted odds ratio of 7.06 (95% CI = 1.56, 31.93). When the outcome of placement was examined, the adjusted odds ratio was 1.66 (95% CI = .74, 17.83) after controlling for three variables—either maltreatment or placement of an older sibling,

use of alcohol during pregnancy, and greater than a 1-day stay in the neonatal intensive care unit. The adjusted value was decreased compared with the unadjusted value of 3.70 (95% CI = 1.83, 7.47). Thus, for both outcomes, the differences in the occurrences of baseline variables between the cocaine-exposed and comparison groups accounted in part for the elevated unadjusted values.

## DISCUSSION

In this population-based study, we showed that by 2 years of age, children born to mothers who used cocaine during pregnancy were 6.5 times more likely to be maltreated and 5.0 times more likely to be placed outside the home compared with a sociodemographically similar comparison group. Almost all of the episodes of maltreatment to the children in the cocaine-exposed group were attributable to neglect or abandonment. No episodes of sexual abuse were noted in either group, probably because of the young age of the children. In addition, approximately 25% of the children in the cocaine-exposed group spent some time during the first 2 years of their life being cared for outside their homes either in foster care or with a relative, indicating that these mothers had substantial problems providing adequate care to their children.

The logistic regression analyses showed that at least part of the increased risk was explained by differences in baseline characteristics between the cocaine-exposed and comparison groups. After controlling for these confounding variables, the adjusted odds ratios for both maltreatment and placement outside the home decreased substantially and were no longer statistically significant. Thus, although a mother's use of cocaine is a clear marker of her child's increased risk of maltreatment or placement, it is not by itself a strong explanatory variable.

Previous studies have indicated a strong association between parental cocaine use and maltreatment.<sup>6-9</sup> Most of these studies, however, have examined the rate of cocaine use in parents whose

children have been referred to protective services, and this rate may falsely elevate the association between parental substance abuse and child maltreatment for at least three reasons. First, the parents' use of cocaine may result in a referral to protective services of an at-risk case; for example, in some states cocaine use during pregnancy results in an automatic referral to protective services. Second, studies examining the association have sometimes focused on severely dysfunctional families in which rates of substance abuse are particularly high. For example, in one study, high rates of cocaine use were found in cases of maltreatment that were adjudicated in juvenile court.<sup>7</sup> Because referral to juvenile court may in part reflect the parental use of substances, the rate of cocaine use in this sample is unlikely to be generalizable to other referrals to protective services. Third, reports to protective services may be falsely elevated because of the problem of detection bias, which may occur when clinicians report to protective services children of parents who use cocaine because of injuries that are borderline suspicious for maltreatment or because of actual unintentional injuries. Such injuries might not be reported if the parent did not use cocaine.

Three previous studies have examined the incidence of maltreatment during infancy in children born to women who used cocaine. In one study, which used a methodology that was similar to the current study, Wasserman and Leventhal<sup>9</sup> used a more restricted approach to selecting the women who used cocaine during pregnancy. In that study, the cocaine-using group was selected from the log of urine toxicology screens done on either mothers or infants on the postpartum ward. Because urine toxicologies were often done because of a high-risk social situation, the sample may have been enriched with especially high-risk women who used cocaine. In that study the incidence of maltreatment was 23% in the cocaine-exposed group compared with 9.3% in the current study, suggesting that selection bias may, in fact, have occurred in the earlier study.

In a study of 30 children born to women who used cocaine and 30 sociodemographically matched comparison children, Kelly et al<sup>6</sup> found that 23% of the cocaine-exposed group compared with 3% of the comparison group had been suspected of being abused or neglected after discharge from the hospital. No definition was provided, however, for the outcomes, and the duration of follow-up beyond the newborn period was not specified.

Jaudes and Ekwo<sup>8</sup> examined the protective service agency's central child abuse registry in Illinois for children who were exposed to cocaine in utero and who were identified from 1985 to 1990 at the time of birth at an urban medical center. Of the 513 identified children, 155 were subsequently reported as abused or neglected, and 102 (19.9%) of these were substantiated. Although no specific comparison group was examined, the rate of reporting was two to three times higher than that of children living in the same geographic area in Chicago.

The results of these previous studies and ours focus on the use of cocaine by poor, inner-city

women. It is not clear how generalizable these results are to other populations of women who use cocaine.

### Methodological Improvements

There are several methodological improvements in our study compared with others that have examined the relationship between the use of cocaine and subsequent maltreatment or placements of the child outside the home. First, we identified pregnant women who used cocaine by reviewing the obstetric records of all eligible women as opposed to using a selective approach that identified only socially high-risk users of cocaine. We chose the period of study because by 1989 clinicians in New Haven were regularly asking pregnant women about their use of cocaine.

Second, we included in the comparison group only infants whose mothers had at least two separately documented, negative histories for the use of cocaine. We used this criterion to exclude from this group women whose obstetric records provided limited documentation of whether or not cocaine was used.

Third, we used matching to minimize sociodemographic differences between the cocaine and comparison groups and logistic regression to control for important potential confounders. Although perfect matches could not be identified for every index child, 95% were matched on at least five variables. It is clear from our study and from other studies of pregnant women who used cocaine that the use of cocaine is a marker for the occurrence of other major psychosocial problems that may have important influences on the nurturing environment provided by the mother.<sup>11</sup> In our study, women who used cocaine during pregnancy were more likely to have no prenatal care, use either alcohol or tobacco, have an older child who was maltreated or placed outside the home, or have a notation in the medical record of concern about the appropriateness of housing. After controlling for these differences, cocaine use continued to be a predictor of maltreatment (although it was no longer statistically significant), but not of placement. Although some of the differences in psychosocial risk factors may have been attributable to more careful questioning of the women who used cocaine, in a prospective study of pregnant women who were systematically questioned about various kinds of drug use, use of cocaine also was strongly associated with alcohol and tobacco use (Lago JA, Schottenfeld RS, Pakes J, Forsyth BW. Primary care-based interventions for pregnant cocaine-abusing women: comparison of treatment enrollees and refusers. Presented at Problems of Drug Dependence, Proceedings of 55th Annual Scientific Meeting, Toronto, Canada, 1993).

Fourth, we used predefined criteria to operationalize terms such as child abuse or neglect, and independently rated each injury before arriving at consensus ratings. In addition, one of the raters was blinded to whether the child was in the cocaine or comparison group. Previous studies have relied on reports to protective services to determine whether a child has been maltreated.

## Limitations

There are several limitations to this study. First, to identify mothers who used cocaine during pregnancy, we relied on maternal history and urine screening, which is not considered the most accurate approach to classification. Although systematic screening by analysis of meconium<sup>17</sup> may have provided more complete data, our results collected from medical records are similar to those collected in a prospective research study that began in the prenatal clinic at Yale-New Haven Hospital shortly after we completed enrollment in our study. In that prospective study, which identified women who used cocaine during pregnancy by a structured interview and systematic urine testing, the rate of cocaine use was 16.5% (Lago JA, Schottenfeld RS, Pakes J, Forsyth BW. Primary care-based interventions for pregnant cocaine-abusing women: comparison of treatment enrollees and refusers. Presented at Problems of Drug Dependence, Proceedings of 55th Annual Scientific Meeting, Toronto, Canada, 1993). The rate in our study was 15%, which is not substantially different from that of the prospective study. If women who used cocaine were not recognized in our study and incorrectly classified in the comparison group, our results would tend to underestimate the true difference between the two groups.

Second, the ongoing use of cocaine (or other illegal substances) by mothers was not consistently documented in the children's medical records so that the relationship between ongoing maternal use and the outcomes could not be examined. Based on the experience of clinicians working with women who use cocaine, it is likely that the majority continued to use cocaine after the births of their children. We also could not determine whether the episodes of maltreatment occurred during times of heavy use of cocaine, withdrawal, or nonuse.

Third, limitations occur because the sources of data are medical records. For example, the mother's educational status is not consistently recorded. Despite such limitations, the records provide a rich source of data about a large number of subjects and provide excellent documentation of the injuries for which children are brought for care.

## SUMMARY AND IMPLICATIONS

In summary, in our sample of poor, inner-city women, we found an association between maternal cocaine use and the occurrence of maltreatment (particularly neglect) and placements outside the home. The use of a population-based approach to sampling resulted in a weaker association than had previously been reported. The use of logistic regression analyses indicated that certain social and clinical characteristics of the mothers who used cocaine also were

strongly associated with the outcomes and suggested that the use of cocaine is a marker of risk rather than a single explanatory variable.

These results clearly indicate that women who use cocaine during pregnancy are at increased risk of serious parenting failure. Continued efforts are needed to provide services not only to the children but also to their parents. Intensive treatment programs, such as those provided by Black et al,<sup>18</sup> may decrease the rates of parenting failure and improve the child's nurturing environment.

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Pregnancy: A Population-based Study**

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Schroeder and Nancy Votto

*Pediatrics* 1997;100:e7

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