

ANTIDEPRESSANT AND MOOD STABILIZER EXPOSURE

Pregnant women who use antidepressants (such as selective serotonin reuptake inhibitors, or SSRIs) or other mood stabilizers during their last trimester sometimes give birth to infants who express NAS. The signs and symptoms of NAS may include irritability, tremors, agitation, rapid and shallow breathing, stuffiness and nasal discharge, vomiting, and diarrhea. These effects are short in duration and generally only last for the first week or two of life.

T'S AND BLUES AND OXYCODONE EXPOSURE

T's and Blues are the street name for an intravenously injected drug cocktail comprised of a prescription painkiller called pentacozine (an opioid similar to morphine) and a nonprescription allergy medication. Babies born to women using this drug typically have reduced birth weight, may grow more slowly than their same-aged peers, and may experience withdrawal symptoms similar to infants with prenatal opioid exposure. The same is true for infants prenatally exposed to oxycodone.

PRENATAL CLUB DRUG EXPOSURE

Club drugs such as PCP (angel dust), ketamine (Special K), and lysergic acid (LSD), when used by pregnant women, may lead to NAS in the newborn. Prenatal exposure to these club drugs may result in learning and behavioral problems that endure.

PRENATAL MDMA (ECSTASY) EXPOSURE

There have been a small number of longitudinal human studies of the prenatal effects of MDMA to

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date. Thus far, the research suggests that use of MDMA during pregnancy may lead to permanent neurobiological changes; behavioral abnormalities such as hyperactivity; attention, focusing, and concentration deficits; and learning impairments.

PRENATAL INHALANT OR SOLVENT EXPOSURE

Women using inhalants (such as spray paint or gasoline fumes) or solvents (such as glues and resins) are at risk of kidney, liver, and brain damage; the mortality rate among this group of users is particularly high. Pregnant women who use them are at higher risk for miscarriage. Pregnancies that remain viable have increased incidence of premature birth, low birth weight, IUGR, and birth defects.

NAS ASSESSMENT AND MANAGEMENT

With proper management, the neonate's prognosis for recovery from the acute phase of withdrawal is good. When symptoms of withdrawal appear, simple nonspecific measures should be instituted, such as gentle, infrequent handling, maintaining calm and quiet surroundings, avoiding bright lights, swaddling, and feeding on demand. Careful attention to fluid-electrolyte balance and calorie support is essential, particularly in opioid-exposed infants undergoing withdrawal, because they display uncoordinated sucking and poor feeding, often develop vomiting and diarrhea, and have increased water loss due to rapid respirations and sweating.

Indications for specific treatment, dosage schedules, and duration of treatment have varied widely. As a general guide, if, in spite of nonspecific measures, babies have feeding difficulties, diarrhea, marked tremors, irritability even when undisturbed, or cry continuously; they should be given medication to relieve discomfort and prevent dehydration and other complications. Dosages must be carefully regulated to minimize symptoms without excessive sedation. Extremely low doses of drugs such as antiepileptic medications and mild opiates are effective in treating narcotic withdrawal symptoms in the infant.

NEUROBEHAVIOR IN NEWBORNS

Researchers using well-studied and clinically accepted neonatal assessment scales in evaluating drug-exposed infants noted that they were less able than non-drug-exposed infants to stay alert and less able to orient to auditory and visual stimuli; these effects were most pronounced at 48 hours of age. Drug-exposed infants were generally as capable of self-quieting and responding to soothing intervention as normal neonates, although they were substantially more irritable. These findings have important implications for caregivers' perceptions of infants, and thus may have long-term impact on the development of infant-caregiver interaction patterns.

On measures of social engagement, interactions between drug-dependent mothers and their infants have shown abnormalities. Abnormal interaction was explained by less positive maternal attachment as well as difficult infant behavior, which impedes social involvement. Many of these interactive abnormalities reverted to normal by four months of age, but the need for parenting training is obvious.

SUDDEN INFANT DEATH SYNDROME

Sudden infant death syndrome (SIDS) is defined as the sudden and unexpected death of an infant between one week and one year of age; the child's death remains unexplained after a complete autopsy examination, a full history, and a death-site investigation. Compared to an incidence of approximately 0.55 per 1,000 live births in the general population, narcotic-exposed infants appear to have an increased risk of SIDS. Other high-risk factors for SIDS, such as low socioeconomic status, low birth weight, young maternal age, membership in a racial minority group, and maternal smoking, were all overrepresented in studies of drug-using groups. In a large-scale study, New York City SIDS rates were calculated in 1.2 million births from 1979 to 1989. Maternal opiate use, after controlling for high-risk variables, increased the risk of SIDS by three to four times that of the general population.

LONG-TERM OUTCOMES FOR CHILDREN

Although a drug-exposed newborn may seem free of physical, behavioral, or neurological deficits at the time of birth, the effects of pharmacological agents (used or abused) may not become apparent for many months or years. Although heroin abuse during pregnancy has been recognized for more than fifty years and methadone treatment has been

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employed for more than thirty years, longitudinal follow-up of opioid-exposed infants is still fragmentary. The difficulties encountered in long-term follow-up of this population include an inability to fully document the mother's drug intake, difficulty separating the drug effects from high-risk obstetric variables, problems in maintaining a cohesive group of infants for study, and the need to separate drug effects from those of parenting and the home environment.

The easiest part of caring for the neonate is actually over when drug therapy has been discontinued and the infant is physically well. The most difficult parts then begin—the care involved in discharge

REVIEW

Programmes for the children of illicit drug-using parents: issues and dilemmas

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Abstract

Concern about the health and general well-being of children whose parents use illicit drugs has contributed to an increased interest in intervention programmes, but the number of such services is still limited. We review published papers about residential, home-visiting and non-residential programmes and use these and our experience in studying playgroup-based clinics to outline issues and dilemmas they face. These include balancing trust and acceptance with intervention when problems are identified, harmonizing accessibility and flexibility with the provision of child-focused activities and adult education, finding a location that is both suitable and affordable, appropriately supporting staff, collaborating with other services and securing adequate funding, including for ongoing evaluation and monitoring. [Banwell C, Denton B, Bammer G Programmes for the children of illicit drug-using parents: issues and dilemmas. *Drug Alcohol Rev* 2002;21:381–386]

Key words: child abuse, children's health and well-being, intervention, illicit drug-using parents, playgroups.

Introduction

The health and well-being of children of illicit drug-users are growing areas of concern. While many such children grow up in normal, loving environments, there is evidence that some are at risk of being neglected and abused [1]. For these children, the issues are complex and interactive and include developmental impairment consequent to *in utero* exposure to alcohol and other drugs [2], abnormal and disruptive behavioural patterns exhibited by the children [3–5], physically and psychologically destructive care-giving practices of parents and others, exposure to a range of harmful and unhealthy behaviours along with dangers emanating from them, and poverty [6,7].

Increasingly, specific programmes are being designed to counteract negative influences on the lives of children of illicit drug users. In this paper we review briefly the published evidence about such programmes and draw on these and our experience of studying a community-based programme in Canberra, Australia, to examine

issues and dilemmas which such programmes face. We hope that raising awareness of these challenges will stimulate innovative ways of addressing them and help improve programme effectiveness.

Brief review of programmes for illicit drug-using parents and their children

Most of the published literature on these programmes comes from the United States and includes residential, home-visiting and non-residential approaches. There is no consensus about realistic aims for such programmes. Furthermore, approaches, measured outcomes and impacts have varied widely and cost-effectiveness has not been considered systematically.

Residential and home-visiting programmes

In terms of residential substance abuse programmes, one long-term programme catering for pregnant women and mothers found that integrating a course

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on parenting skills into the programme improved the quality of mother-child interactions and the self-esteem of mothers. However, more than 50% of women did not complete the range of follow-up measures or dropped out of the programme [8]. Another such programme found improvements on parental stress and addiction severity scores 6 months and 12 months after treatment for women who completed the programme [9].

Programmes based on home visiting either by health workers (such as nurses) or trained volunteers are considered a successful model for families with newborns and infants [10,11], but relatively few such programmes target illicit drug users specifically [12]. One US programme, in which a randomized 'intervention group' of drug-users was visited by community health nurses, claimed 'marginal' improvements in that mothers were drug-free and emotionally responsive to their children. At 6 months, children in the intervention group had slightly higher cognitive scores and intervention group mothers were less likely to abuse their children, but differences between the groups decreased over time. The authors cautiously supported home-visiting for drug-users but warned of the difficulties of implementing and managing such a programme [13]. Another programme for high-risk drug and alcohol using mothers using home visits by 'paraprofessional advocates' (trained positive role models experienced in similar adverse life events) found that the mothers were more likely to enter drug and alcohol treatment, to use birth control regularly and to use health and social services for their children [14,15]. A recent randomized study of home visiting by nurses to children exposed to drugs *in utero* showed improvements in child behavioural problems and reduced mean parental distress scores. This study also noted the difficulty of retaining participants [16].

There are also two Australian studies. A randomized control trial with mothers who were deemed 'vulnerable' over a range of factors including drug and alcohol use, showed reductions in postnatal depression scores and improvements in maternal-infant interactions and the home environment at 6 weeks [17]. A pilot of the 'Parents under Pressure' programme found significant improvements in all three domains targeted: parental functioning, parent-child relationship and parental substance use and risk behaviour [18].

Non-residential programmes

There are many non-residential programmes in the United States, but the number described and evaluated is limited. The latter includes the CASAWORKS for Families national programme which addresses substance use, literacy, job acquisition and a range of other skills including parenting skills and support for children

of substance abusing mothers [19]. The programme is currently under evaluation but preliminary data suggest that women show significant increases in abstinence from drugs and increases in employment. Similarly, the Strengthening Families Programme in the United States, which is aimed at 6-12-year-old children of drug users and their families, showed a long-term positive impact on outcomes such as children's problem behaviours, emotional status and prosocial skills, parents' parenting skills and family environment and functioning [20]. Another programme, which recruited women during pregnancy, found benefits in terms of improvements on a range of measures of child growth and development for the mothers who reduced their alcohol and other drug use [21].

In the Focus on Families programme, parents receiving methadone treatment were given long-term skills training, which showed improvements in parent skills, parental drug use and family management. However, there was little impact on their children aged 3-14 with regard to reports on parental involvement; and for the older children, problem behaviour and drug use [22,23].

We are aware of two Australian non-residential programmes based on the more general model of playgroups; in other words, a group of parents and children who meet to promote interaction. Playgroups are community-based and aim to assist children to develop fundamental skills, such as sharing, co-operation and problem-solving through play and interaction with other children and adults. They also aim to give parents an opportunity to share information, and have time to play with their children. They cater for babies and preschool children, but are not considered a substitute for formal preschool education.

The programme we studied is described in more detail in the next section. The other programme was developed in an area with a high incidence of child abuse and used a playgroup model to enhance mothers' interactions with their preschool children and to improve mothers' sense of competence and effectiveness, thus reducing parental stress and the risk of child abuse [23]. While those participating reported developing valuable skills, quantitative outcome measures were not sensitive enough to detect any differences between mothers in the experimental group and those in the control group.

Our study of a Canberra-based programme

The Canberra-based Parents' and Children's Clinics (PACCs) started as a playgroup in 1990. They are described in detail elsewhere [24,25], but essentially aim to provide drug-using parents and their children with a non-judgemental service focusing on health, welfare and advocacy needs. Two clinics, in separate

locations, operate for a 3- or 4-hour session each week. They are staffed by a co-ordinator and two workers, at least one of whom is a peer educator, and attended by two outreach community nurses and, fortnightly, by a women's health nurse. The programme provides health checks and play activities for children, lunch, as well as referrals, advocacy and education. No demands are made of parents regarding their drug use, although they are supported in reducing associated harms, including if they choose to seek treatment or become abstinent.

Two of the authors (BD and CB) were engaged in participant observation for 4 months in early 1999, in addition to conducting formal interviews with 30 parents (21 mothers and nine fathers) and 10 past and present PACCs staff. Eight staff from other government and non-government agencies dealing with drug treatment services and child protection services were interviewed about their awareness of the PACCs activities and their relationships with the clinics (for a full report, see [25]).

The parents interviewed included most of the regular attenders at the clinics (12 mothers and three fathers). A further 10 of the parents interviewed (six women, four men) attended intermittently. The remaining five parents, recruited at the public methadone treatment clinic, were interviewed to ascertain why they did not attend PACCs. The mothers were aged from 22 to 42 years (mean age 30); the fathers from 25 to 49 years (mean age 34). They had an average of one child aged between 2 months and 5 years (range one to two children) and an average of one (fathers) or two (mothers) children in total (range one to five children). One woman was Aboriginal, the rest were of European descent. Eleven women and four men had a current partner and all had some secondary education. Most had annual household incomes between \$10 000 and \$20 000. None were employed, most lived in rental accommodation and did not have a car. Twelve women and three men were in methadone treatment; nine women had never accessed treatment and seven men had been in treatment previously. Two women had not used drugs (including alcohol and tobacco) in the last month, while most used three or four classes of drugs during the same period. One mother and four fathers had an AUDIT score higher than 8 indicating probable social and health problems associated with alcohol consumption. All but one of the men had been arrested and five men had been in gaol.

In terms of programme functioning, the findings reinforced earlier research [24] which provided descriptive data showing that the programme had achieved a number of aims, but also illustrating some problems. The research provided a trigger for identifying general issues and dilemmas relevant to providing

services aimed at the children of illicit drug users, which is the focus of this paper.

Issues and dilemmas

Balancing trust and acceptance with intervention when problems are identified

A major dilemma for programmes is to find an appropriate balance between establishing trust to encourage parents to participate in programmes and dealing with problems. In the case of the PACCs, staff accept that their clients may engage in illegal activities elsewhere, but set boundaries about what sorts of behaviours are accepted at the clinics. In general, parents understand, appreciate and accept clinic 'rules', such as no drug use and guidelines about acceptable behaviour in front of children.

Dealing with child abuse and neglect can be more challenging. While the PACCs were not established specifically to deal with or monitor child abuse and neglect, this was encompassed in their general concern with children's health and well-being. Current and past staff reported a number of instances in which they had subtly and successfully intervened. Parents who reported the negative effects of domestic violence and abuse on their children also described receiving assistance from PACCs staff in accessing other services. Other parents, who were being monitored by government agencies over the care of their children, saw a role for PACCs staff in verifying their ability to look after their children and in mediating between them and the government agencies.

An overarching issue is that guidelines for recognizing abuse and neglect tend to be fairly general, so that perceptions can vary widely. They can range from concerns about hygiene, nutrition and standards of dress, to those of safety, including exposure to drug use and equipment, or leaving a child unattended while obtaining or using drugs. PACCs staff pointed out that social expectations may specifically disadvantage drug-using parents and questioned whether lack of material possessions, untidiness and being dirty constituted neglect if the child was happy and well adjusted.

It is noteworthy that PACCs staff, other health professionals and parents were generally reluctant to discuss abuse and neglect with the researchers. PACCs staff and other health professionals worried about destroying the trust they had established with parents, while parents worried about the potential for losing their children. Other researchers have reported similar difficulties [26].

It is likely that routine monitoring by specialist services of children's psychological, physical and emotional needs can both prevent and deal with problems, without singling parents out.

Harmonizing accessibility and flexibility with the provision of child-focused activities and adult education

Accessibility and flexibility are often seen to be synonymous with lack of structure, especially when services target illicit drug users. Regardless of whether this belief is justified, programmes such as the PACCs provide an ideal setting for organized early childhood development activities, such as those proposed by McCain [28]. They fit with a model that advocates play-based problem-solving activities to promote early childhood development and learning.

In addition, programmes can build capacity [29] in parents through formal, informal and incidental learning opportunities. In the case of the PACCs, a survey conducted by the non-government organization that runs them found that a substantial proportion of attendees, as well as the organization's other clients, wanted to improve interpersonal relationships, access to health-care and employment [30]. Therefore, an education course was run on job-seeking skills, communication and literacy and computer skills. Education sessions were also provided on blood-borne viruses, safe injecting practices and parenting skills.

Informal learning is more in keeping with notions of an unstructured approach, but requires explicit attention by staff, who need to be alive to opportunities. For example, a peer worker can lead a casual discussion about the risks of hepatitis C transmission allowing parents to 'test' their own knowledge and clearly stating what is and is not risky. Incidental learning is similar and occurs when, for example, parents watch how workers successfully interact and play with children and cope with difficult child behaviour.

Finding a location that is both suitable and affordable

While location might seem to be straightforward, it can make a crucial difference to programme success. The service needs to be reached easily by public transport, accessible for women with children in prams, as well as safe, healthy and comfortable. Hygienic food preparation and serving facilities are necessary, as well as storage facilities for toys and equipment. The rental on such centrally located and accessible premises may be beyond the means of community-based organizations. In addition, if the premises are too convenient, they may become venues for drug dealing. This happened to the Canberra-based PACCs, which subsequently had to move [24].

Supporting staff

There has been an evolution in the PACCs programme which has meant that the activities are driven less by the involvement of parents (as in traditional playgroups) and now depend more on trained and peer workers.

This has implications for both funding (increased funding is needed) and control, with care needed so that the parents learn skills and are empowered, rather than having inadequacy and alienation reinforced. Similar issues have been noted in playgroups in the United Kingdom ([31]; these were aimed at disadvantaged parents, not drug users).

Although the PACCs received favourable comments from many of their current and past staff, it was apparent that they found working in the programme stressful, demanding and difficult at times. Staff need regular opportunities to debrief and considerable support, both emotionally and intellectually.

Ongoing and expansive training is important for peer workers, not only to extend their own capacities but to provide them with credibility that is not reliant on their drug experiences, and to open up employment opportunities in the future. In addition, all staff benefit from formal training in legal obligations and how to meet them, referral and collaboration with other agencies [27], the likelihood of health risks and how to deal with them, and dealing with ethical dilemmas. This training needs to be backed-up by ongoing support and peer workers may also need support in dealing with their own drug use.

Collaborating with other services

The PACCs have always had a strong collaboration with community nurses. The community nurse who was originally involved in establishing the programme had a special interest in communicable diseases and vaccination and prompted participants to access appropriate services. The two nurses who are currently involved have an explicit focus on the whole family and act as a source of referrals to a wide range of medical and social services. An important challenge for the nurses, who are employed by the government to undertake a range of duties, is to find an appropriate balance between the many demands on their time.

Links with other drug services, as well as with welfare services, can also be mutually beneficial. However, these are highly dependent on the energy of individual staff and can be challenging if there are philosophical differences, particularly about keeping children with problem parents. Open discussion and frequent formal and informal review can be helpful, although the trust of the parents also has to be protected.

Securing adequate funding, including for ongoing evaluation and monitoring

PACCs was not funded for ongoing evaluation and monitoring, nor is this common for other programmes of this type, even though there are substantial benefits, including:

- Maintaining a high level of responsiveness to needs and adapting to changes in patterns of drug use and their associated problems. For example, heroin use is now being commenced at a younger age, which in turn means that the needs of younger parents need to be met.
- High level awareness of issues and problems in order to turn to advantage changes in funding and funding priorities and to maximise new funding opportunities, that may come from related areas. For example, PACCs receives funding from alcohol and other drugs sources and a health promotion fund [24], but intersects with family programmes, early child development and education, and other community-based initiatives that are also potential funding sources.
- Early warning for management of staff burnout or other problems.
- Developing reflexive, evidence-based practice, especially if staff are given a role in collecting and reviewing data.

It is not only funding for ongoing monitoring and evaluation that is an issue. Funding to run the PACCs programme itself was extremely tight and this curtailed what the programme could achieve. It is unreasonable to expect inadequately funded programmes to counteract the negative influences of parental drug use on children.

Conclusion

Services that monitor and cater for the specific health needs and general well-being of children of drug-using parents are still in short supply. A range of programmes is described which could provide models, including playgroup-based clinics, which seem to be unique. However, such programmes present specific challenges which must be dealt with for the ongoing viability of current programmes and when establishing new ones. Although successful strategies are likely to be context-specific, documenting and sharing them is still highly likely to be worthwhile and to contribute overall to helping these programmes to better meet their aims.

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Mother–Infant Interaction: Effects of a Home Intervention and Ongoing Maternal Drug Use

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Examined the effects of a home-based intervention on mother–infant interaction among drug-using women and their infants. At 2 weeks postpartum, mothers and infants were randomly assigned to either an intervention (n = 84) or a control (n = 87) group. Control families received brief monthly tracking visits, and intervention families received weekly visits by trained lay visitors. Mother–infant interaction was evaluated at 6 months through observation of feeding. Although there were no direct effects of the intervention, in the control group, mothers who continued to use drugs were less responsive to their babies than mothers who were drug free. In the intervention group, drug use was not associated with maternal responsiveness. Weekly home-based intervention may be a protective strategy for children of drug-using women because it disrupts the relation between ongoing maternal drug use and low maternal responsiveness.

Drug abuse among women is often associated with a chaotic caregiving environment (Butz, Lears, O'Neil, & Lukk, 1998), placing infants at significant risk for poor outcome because of prenatal drug exposure and nonresponsive parenting. Maternal substance abuse has been associated with domestic abuse (Amaro, Fried, Cabral, & Zuckerman, 1990), child abuse (Kelley, 1992; Leventhal et al., 1997), and attachment problems (Kelley, 1992), yet the research findings on the parenting of drug-using mothers are contradictory. Some researchers have found that drug-using mothers show less enjoyment and enthusiasm compared with nondrug-using mothers (Burns, Chethik, Burns, & Clark, 1997), and others have found no differences in maternal behavior (Black, Schuler, & Nair, 1993; Schuler, Black, & Starr, 1995).

The focus of much of the research on drug-using mothers and their infants has been on the short- and long-term effects of prenatal drug exposure. Few researchers have examined the impact of ongoing maternal drug use on parenting ability or infant outcome. Although maternal drug use beyond the neonatal period has been measured by using urine analysis and hair analysis (Callahan et al., 1992; Graham, Koren, Klein, Schneiderman, & Greenwald, 1989), the majority of studies have used maternal report even though the accuracy of this method has been questioned (Zuckerman et

al., 1989). Regardless of how it is assessed, drug addiction is a chronic relapsing disease. Women who continue to use drugs often are unable to provide a consistent, nurturing environment for their children (Hawley, Halle, Drasin, & Thomas, 1995; Zuckerman, 1994). Drug-exposed children raised in homes with ongoing maternal drug use are more likely to display problems in cognitive development at 3 years than drug-exposed children raised in drug-free environments (Griffith, Azuma, & Chasnoff, 1994). This relation may be at least partially explained by drug-using parents' inability to provide a stable, nurturing environment (Zuckerman, 1993), together with low levels of positive maternal and infant behaviors during mother–infant interaction.

Interventions often are designed to help mothers identify and implement coping strategies that will enhance their parenting skills and improve the outcome of the children in high-risk families. Results from a multisite, randomized trial indicate that at 3 years, premature infants in a comprehensive early intervention had better cognitive and behavioral outcomes (Infant Health and Development Program [IHDP], 1990). Other research from the IHDP indicates that the intervention led to more positive maternal and child behavior during mother–child interaction at 30 months (Spiker, Ferguson, & Brooks-Gunn, 1993).

Home- and center-based intervention programs have been used with drug-using parents and their children. Home-based intervention programs with drug-using women often use community health nurses to provide a child development curriculum and assistance with maternal social needs (Black et al., 1994; Hofkosh et al., 1995). These home-based interventions over the first 12 to 18 months postpartum led to better mother–

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infant interaction (Hofkosh et al., 1995), higher infant cognitive scores, and a more stimulating and responsive home environment (Black et al., 1994) in comparison with control infants. Among adolescent drug-using mothers, one successful center-based program included drug treatment and parenting and vocational classes. This center-based program led to better mother-infant interaction scores and higher infant cognitive scores in comparison with control group mothers and infants (Field et al., 1998). A combined home-based and parenting skills training program with opiate-addicted parents increased positive involvement and communication between the parents and their children, despite ongoing drug use in 20% of the parents (Catalano, Haggerty, Gainey, & Hoppe, 1997).

In summary, the research indicates that ongoing maternal drug use and the effects of an intervention program may be associated with infant and maternal outcomes. Ongoing maternal drug use negatively affected cognitive outcomes among drug-exposed children (Griffith et al., 1994), but few researchers have examined how ongoing maternal drug use affects behavior during mother-infant interaction. Home- and center-based interventions led to more positive behavior during mother-infant interaction (Field et al., 1998; Hofkosh et al., 1995; Spiker et al., 1993). Finally, the research suggests that there might be an interaction between ongoing maternal drug use and intervention group status. Ongoing maternal drug use without an intervention led to lower cognitive scores in children (Griffith et al., 1994), but an intervention led to more positive involvement and communication between parents and children despite ongoing parental drug use (Catalano et al., 1997).

The purpose of this research was to compare mother-infant interaction among drug-using mothers who did and did not receive a home-based intervention. First, we hypothesized that mothers and infants in the intervention group would display significantly more positive behaviors during mother-infant interaction than mothers and infants in the control group. Second, based on previous research, we hypothesized that intervention group status and ongoing maternal drug use would be related to maternal and infant behavior during mother-infant interaction. Finally, because previous research indicates that drug-affected families benefited from an intervention despite ongoing parental drug use, we hypothesized that regardless of ongoing maternal drug use, mothers and infants in the intervention group would display more positive behavior.

Method

Participants

Participants were part of an ongoing longitudinal randomized clinical trial among drug-using women

and their infants. They were recruited from a university hospital that serves a largely inner-city African American population. Women were eligible for recruitment if they or their infants had a positive urine toxicology screen at birth or if a history of recent drug use was noted in the medical charts. Infants who were not discharged into the care of their mothers were not eligible. Infants who had serious developmental or congenital problems that required special services (e.g., spina bifida) were not eligible because the services received by the infants often included a home-visiting component, which would have interfered with the randomization in this study.

Of the drug-using women who were approached about participating in the study, 28% declined to participate. The mothers who declined to participate did so for various reasons: 41% said they were not interested in participating, 17% denied drug use, 27% preferred to receive primary pediatric care at another site, and 15% declined for other reasons (the baby's father refused, they had a transportation problem, or the mother was in another research program).

Available Data

This study included 171 families (87 control, 84 intervention). Thirty-one dyads were lost before the 2-week baseline visit, and 32 additional families were lost after the 2-week visit (see Table 1). Thus, 192 (97 control, 95 intervention) families were seen for the 6-month evaluation visit. Observation data were dropped from 13 families because the interaction involved a caretaker other than the mother, and data from 8 families were lost because of mechanical difficulties (the camera was out of focus or knocked off balance). There were no significant group differences on any maternal demographic or infant perinatal variables between dyads included in this study and those dyads that were not.

Table 1. Reasons for Subject Loss Before and After 2-week Baseline Visit

	Before 2-Week Visit ^a	After 2-Week Visit ^b
Infant Died	1	3
Infant in Foster Care	9	9
Family Not Found	4	6
Family Withdrew	2	0
Family Noncompliant	15	0
Family Moved Out of State	0	2
Error in Recruitment	0	3
Mother Entered Long-Term Residential Drug Treatment	0	1
Noncompliant With Scheduled Visit	0	8

^a*n* = 31. ^b*n* = 32.

Home Visiting

One full-time African American lay visitor was recruited to visit the control families. Mothers in the control group received brief monthly home tracking visits to reduce attrition. The mean number of home visits made to the control families during the first 6 months was 2.7 ($SD = 1.7$, range = 0–7), and the mean length was 16.6 min ($SD = 5.4$). The control worker met with a psychologist and a pediatrician for bimonthly supervisory meetings.

Mothers in the intervention group received weekly home visits during the first 6 months postpartum from one of two full-time lay visitors. The visitors were two middle-age African American women who had previous experience making home visits and knew the community where the mothers lived. The visitors shared the caseload of families, but each visitor was assigned to specific families. The mean number of visits made during the first 6 months was 8.9 ($SD = 5.6$, range = 0–23), and the mean length was 30.1 min ($SD = 5.8$). The intervention visitors met with a psychologist and a pediatrician weekly to track the progress of the families and to discuss concerns about the families.

Home Intervention Protocol

The home intervention was developmentally oriented and was based on the program used by the IHDP (1990). The IHDP program had three components: home-based intervention starting in the first year, child attendance at a child development center, and parent group meetings starting the second year postpartum. The focus in this article is on the home-visiting protocol and parent–infant interaction at 6 months of age.

As specified in the IHDP program, the home intervention had both a parent and an infant component. However, because the IHDP program was not focused on drug-using parents, we added information about drug use and drug treatment to the content of the home intervention. The goal of the parent component was to increase maternal empowerment by enhancing the mothers' ability to manage self-identified problems by using existing services and family and social supports. The topics covered during the maternal component included housing, public assistance programs (e.g., Supplementary Nutritional Services to Women, Infants, and Children), partner abuse, and the effects of drug use and drug treatment. To establish consistency in the content of the home visit, we created a Personal Contact Form. The contact form documented the time spent with the family and the content and quality of the contact. It also contained information about the four levels of contact used during the maternal home intervention: relationship building between the mother and home

visitor, caretaker's personal problems/concerns, infant development, and health education.

The goal of the infant component was to promote infant development by using a program of games and activities. The home visitors were trained to use the *HELP at Home: Hawaii Early Learning Profile* (1991), which is a comprehensive curriculum containing 650 developmental skills for children ages birth to 36 months. An activity sheet to use as a guide to help parents learn about child development accompanies each developmental skill. The home visitors modeled the behavior/activity on the sheet. By teaching mothers appropriate ways to play with their infants, our goal was to enhance communication between mothers and infants and to help the mothers provide a developmentally stimulating play environment.

Measures

Drug use. All the mothers in this study had a history of cocaine and/or heroin use. At the 6-month evaluation visit, mothers were asked about their prior and current use of cigarettes, alcohol, heroin, cocaine, marijuana, tranquilizers, amphetamines, barbiturates, and methadone. Mothers who reported that they had continued using cocaine and/or heroin in the last 6 months were given a score of 1. Mothers reporting that they had stopped using heroin and cocaine were given a score of 0. Marijuana and alcohol use were coded the same way (0 = no use, 1 = use).

Mother–infant interaction. We assessed maternal and infant behavior by using videotaped observations of mothers and infants during feeding at 6 months. We used a feeding interaction rather than play because infants and mothers spend much of their time feeding, and feeding often elicits more behavioral extremes than does play (Black, Hutcheson, Dubowitz, Starr, & Berenson-Howard, 1996). We scored the mother–infant interactions by using rating scales (Cowan & Cowan, 1992) that were used previously in a population of at-risk, inner-city, African American families (Hutcheson et al., 1997). These scales are based on the quality of the parent–child interaction; thus, they are not tied to specific age-related behaviors in the child (P. Cowan, personal communication, September 23, 1999). For example, parental warmth is based on a range of behaviors that include the parent demonstrating affection, laughing, hugging, and touching the child; a feeling of connection between parent and child; and the parent providing reassurance, encouragement, and a generosity of affect. Each item on the parent rating scale and infant rating scale represented a global rating of the behavior during the 10-min interaction. Items were scored on a 5-point scale ranging from 1

(*very low*) to 5 (*excessive*). Because both very low and very high scores were nonoptimal, the high nonoptimal scores were recoded before the analyses so that high scores represented the most positive interactions.

We dropped two maternal behaviors (limit-setting, maturity demands) and eight child behaviors (compliance, defiance, anxiety, planfulness, persistence, creativity, precision in language, shyness) because they were not appropriate for use with 6-month-olds. The remaining 17 maternal behaviors were pleasure, displeasure, respect, confidence, expressiveness, precision in language, structure, warmth, coldness, anger, responsiveness, interactiveness, creativity, activity level, happiness, sadness, and anxiety. The remaining 14 infant behaviors were warmth, coldness, dependency, autonomy, anger, enthusiasm, frustration, expressiveness, curiosity, activity level, interactiveness, attentiveness, happiness, and sadness. Cronbach's alpha was used to measure the internal consistency of the remaining maternal and infant behaviors. The alpha coefficients were .95 and .90, respectively.

Trained coders who were unaware of the purpose of the research or the intervention status of the families scored the videotapes. There were two independent groups of coders; one group coded maternal behavior, and the other group coded child behavior. All coders were trained until they reached over 90% reliability on the scales, and reliability was maintained through weekly reliability checks. Reliability was defined as no more than a 1-point difference among the coders. Approximately 10% of the tapes were used for reliability checks for parent behavior, and the interrater agreement ranged from .82 to .99. Approximately 12% of the tapes were used for reliability checks for infant behavior, and the interrater agreement ranged from .79 to .98.

Procedure

Eligible mothers were approached in the hospital shortly after giving birth. Mothers who agreed to participate signed a consent form approved by the Institutional Review Board of the University of Maryland and completed a short demographic and tracking form, administered orally. The mothers were given an appointment for a 2-week baseline visit. At the end of the baseline visit, the mothers were assigned randomly to the intervention or control group. Research assistants who were unaware of the intervention status of the mothers and infants conducted all evaluation visits in a hospital clinic. All mothers were given information on drug treatment programs; however, treatment was not mandatory to participate in the study. Mothers were paid for each clinic evaluation visit and were given bus tokens to get home.

As part of the 6-month evaluation visit, the mothers completed measures assessing maternal drug use over

the last 6 months, and the mother-infant dyads were videotaped for 10 min during feeding. Baby food, a high chair, a table, and several adult chairs were provided. Mothers were instructed to feed their infant using the method they used at home (e.g., high chair or holding in their laps). The camera was in the room, but an operator was not present.

Results

We ran two principal components analyses to reduce the number of maternal and infant interaction dimensions. Only those dimensions with factor loadings above .50 were retained. Five maternal dimensions were selected to form a maternal responsiveness factor: responsiveness, confidence, structure, lack of anger, and lack of anxiety (factor loadings ranged from .52 to .74). Eight infant dimensions were selected to form an infant warmth factor: warmth, enthusiasm, interactiveness, happiness, curiosity, lack of coldness, lack of anger, and lack of frustration (factor loadings ranged from .53 to .83). The eigenvalues for both factors exceeded 1. The correlation between maternal responsiveness and infant warmth was .38 ($p < .01$), indicating modest overlap.

The analyses in this study are based on intention to treat rather than the amount of intervention received (Meinert, 1986), because this method provides a conservative estimate of the intervention effect. Thus, mothers who were randomized into the intervention group were retained in that group, even if they refused all intervention ($n = 6$). We used multivariate analysis of variance and chi-square analyses to determine if there were significant group (control vs. intervention) differences. There were no significant group differences on any maternal demographic or infant perinatal variable (see Table 2). At 6 months, there were no significant group differences on maternal responsiveness or infant warmth, $F_s(2, 171) < 1.0$, $ps > .05$ (see Table 3). There were no significant group differences in use of existing services at 6 months, $\chi^2_s(1, N = 171) < 1.8$, $ps > .05$, except that significantly more control mothers reported being currently involved with Protective Services, $\chi^2(1, N = 171) = 9.2$, $p < .01$ (see Table 3).

At 6 months, there were no significant group differences in cocaine and/or heroin use, alcohol use, $\chi^2_s(1, N = 146) < 1$, $ps > .05$, or marijuana use, $\chi^2(1, N = 146) = 2.6$, $p > .05$, during the last 6 months (see Table 3). However, as Table 3 indicates, 44% of the control mothers and 46% of the intervention mothers reported ongoing cocaine and/or heroin use at 6 months. In addition, 68% of the control mothers and 65% of the intervention mothers reported ongoing alcohol use. Finally, 38% of the control mothers and 25% of the intervention mothers reported ongoing marijuana use.

Table 2. Maternal Demographic and Infant Perinatal Variables Among the Control and Intervention Groups

	Control ^a		Intervention ^b	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Maternal Variables				
Maternal Age (Years)	27.1	5.2	27.0	5.2
Maternal Education (Years)	10.9	1.6	10.9	1.4
Age at First Pregnancy (Years)	18.7	4.3	18.2	3.8
% Single	96.4		91.7	
% Unemployed	97.7		100.0	
% African American	97.7		94.0	
Infant Variables				
Birth Weight (gm)	2,784	497	2,812	483
Head Circumference (cm)	32.7	1.8	33.0	2.3
Birth Length (cm)	47.4	6.1	47.8	2.8
Gestational Age (Weeks)	38.8	2.3	38.3	2.1
1-min Apgar	8.1	1.1	7.9	1.2
5-min Apgar	8.9	0.3	8.9	0.5
% Male	48.9		44.0	
% Preterm (<37 Weeks)	11.2		17.6	

^a*n* = 87. ^b*n* = 84.

Table 3. Group Differences on Dependent, Predictor, and Outcome Variables Measured at the 6-Month Visit

	Control ^a		Intervention ^b	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Maternal Responsiveness ^c	3.3	0.4	3.6	0.4
Infant Warmth ^c	2.5	0.4	2.5	0.4
Substance Use (%) in Past 6 Months				
Alcohol	68.0		64.8	
Marijuana	37.8		25.4	
Cocaine and/or Heroin	44.0		45.6	
Families Receiving Services in the Last 6 Months (%)				
AFDC	85.1		89.3	
Medical Assistance	93.1		91.7	
WIC	89.7		95.2	
Food Stamps	87.4		91.7	
Protective Services	31.0		11.9*	

Note: AFDC = Aid to Families With Dependent children; WIC = Supplementary Nutritional Services to Women, Infants, and Children.

^a*n* = 87. ^b*n* = 84. ^cHigher scores optimal.

**p* < .01.

We used two hierarchical multiple linear regression analyses to examine the association among group status (control vs. intervention), ongoing maternal drug use, and mother or infant behavior during feeding. Maternal age, infant birth weight, and infant sex were correlated with either maternal responsiveness or infant warmth. Therefore, as a means of controlling for these variables, they were entered on the first step in both regressions.

In the first hierarchical multiple linear regression, the dependent variable was maternal responsiveness. Maternal age, infant birth weight, and infant sex were entered on the first step. Group status (control vs. inter-

vention) was entered on the second step. To prevent ongoing marijuana and alcohol use from being confounded with the effects of ongoing cocaine and/or heroin use, we entered marijuana and alcohol use in the third step. Then ongoing drug use was entered, followed by the Group × Ongoing Drug Use interaction. The interaction of Group × Ongoing Drug Use was entered to examine whether the association between ongoing drug use and maternal responsiveness differed for those in the intervention and control groups. The overall equation was significant, $F(8, 136) = 3.8, p < .01$. There were two significant predictors of maternal responsiveness: infant birth weight, $F(3, 141) = 5.0, p < .01$, and the interaction of group status and ongoing drug use, $F(1, 136) = 9.9, p < .01$ (see Table 4).

To interpret the interaction of group status and ongoing maternal drug use, we graphed the data (Cohen & Cohen, 1983). As Figure 1 shows, in the control group, maternal responsiveness was lower among mothers who continued to use cocaine and/or heroin. In contrast, among intervention mothers, maternal responsiveness did not differ between those who did and did not continue drug use (see Figure 1).

In the second hierarchical multiple linear regression, infant warmth was the dependent variable. Maternal age, infant birth weight, and infant sex were entered on the first step. Group status (control vs. intervention) was entered on the second step. To prevent ongoing marijuana and alcohol use from being confounded with the effects of ongoing cocaine and/or heroin use, marijuana and alcohol use were entered in the third step. Then ongoing drug use was entered, followed by the Group × Ongoing Drug Use interaction. We entered the interaction of Group × Ongoing Drug Use to examine whether the association between ongoing drug use and infant warmth differed for those in the intervention and control groups. The overall equation was significant, $F(8, 136) = 3.2, p < .01$. Infant birth weight was a significant predictor of infant warmth, $F(3, 141) = 6.6, p < .01$, but no other variable entered the equation (see Table 5).

Discussion

Despite a relatively intensive intervention, the intervention had no overall effects on maternal responsiveness or infant warmth at 6 months. Although there were no direct effects, there was an association between ongoing maternal drug use and maternal responsiveness during mother–infant interaction, which differed by group. In the control group, mothers who continued to use drugs were less responsive to their babies than were mothers who were drug free. In the intervention group, drug use was not associated with maternal responsiveness. Other research also indicates that an intervention leads to more positive parenting among drug-using mothers (Black et al., 1994; Field et al., 1998).

Contrary to expectations, the intervention had no effect on maternal responsiveness during mother-infant interaction. This contradicts previous research that indicates that an intervention with drug-using women leads to better maternal interaction behavior (Field et al., 1998) and more positive parenting (Catalano et al., 1997). However, the caregivers in the previous studies were involved in drug treatment programs, and neither study used a home-based intervention exclusively. Research indicates that the home environments of drug-using women are disorganized and lack stability (Butz et al., 1998). Drug-using women are exposed to multiple negative risk factors such as violence, negative life events, and depression (Kettinger, Nair, & Schuler, 2000). In addition, all the families in this study continued to live in poverty, which is associated with higher family stress, maternal depression, and inadequate so-

Table 4. Summary of Hierarchical Regression Analysis for Variables Predicting Maternal Responsiveness

Variable	B	SE B	β
Step 1			
Infant Birth Weight	.0002	.000	.229*
Maternal Age	.0078	.006	.113
Child Sex	.1280	.060	.113
Step 2			
Group	.0562	.058	.078
Step 3			
Alcohol Use	.0432	.064	.057
Marijuana Use	.0015	.065	.002
Step 4			
Ongoing Drug Use	-.1000	.060	-.138
Step 5			
Group \times Ongoing Drug Use	.3590	.114	.815*

Note: Total $R^2 = .18$, $F(8, 136) = 3.81$, $p < .01$. $R^2 = .10$ for Step 1; R^2 change = .01 for Step 2; R^2 change = .01 for Step 3; R^2 change = .02 for Step 4; R^2 change = .06 for Step 5.

* $p < .01$.

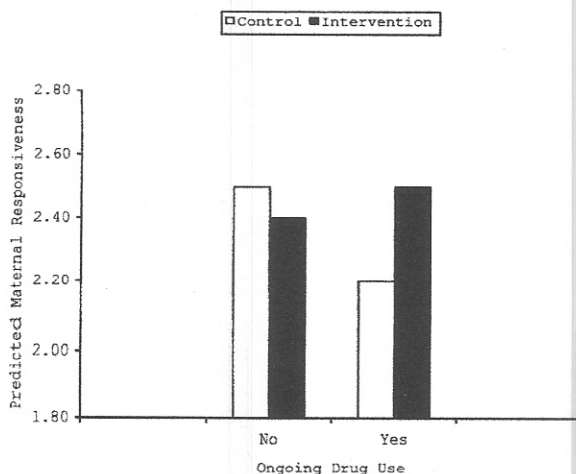


Figure 1. Predicting maternal responsiveness from group membership (control vs. intervention) and ongoing maternal drug use (no vs. yes) using multiple regression analysis.

Table 5. Summary of Hierarchical Regression Analysis for Variables Predicting Infant Warmth

Variable	B	SE B	β
Step 1			
Infant Birth Weight	.0003	.000	.346*
Maternal Age	.0016	.006	.022
Child Sex	.0725	.061	.096
Step 2			
Group	.0640	.059	.085
Step 3			
Alcohol Use	.0702	.065	.089
Marijuana Use	-.0151	.066	-.019
Step 4			
Ongoing Drug Use	.0562	.061	.075
Step 5			
Group \times Ongoing Drug Use	.1890	.120	.414

Note: Total $R^2 = .16$, $F(8, 136) = 3.19$, $p < .01$. $R^2 = .12$ for Step 1; R^2 change = .01 for Step 2; R^2 change = .01 for Step 3; R^2 change = .01 for Step 4; R^2 change = .02 for Step 5.

* $p < .01$.

cial support (Parker, Greer, & Zuckerman, 1988). The overwhelming effects of poverty and ongoing maternal drug use may blunt the effects of the home intervention on maternal responsiveness.

The findings on infant warmth contradict research that indicates the beneficial effects of an intervention on infant interaction at 6 months among drug-exposed infants (Field et al., 1998). However, the infants in the Field et al. study were in center-based day care 5 days a week, whereas this study included only a home-visiting component at this age. Similar to other home-visiting programs with poor families living in the inner city (Hardy & Streett, 1989), the home visitors had a difficult time focusing on the specific components of the intervention. They spent a great deal of time dealing with the day-to-day crises these families faced such as housing problems, lack of electricity, no money, no food, and abusive relationships.

Although the intervention had no effect on either maternal responsiveness or infant warmth during mother-infant interaction at 6 months, the home-based intervention disrupted the relation between ongoing maternal drug use and low maternal responsiveness in the intervention group. Research indicates that drug-using mothers exposed to a high number of risk factors, such as depression, had poorer parenting attitudes than drug-using mothers exposed to a low number of risk factors (Kettinger et al., 2000). An intervention among drug-using adolescent mothers (Field et al., 1998) reduced depression and stress scores, which are some of the factors associated with poorer parenting attitudes (Kettinger et al., 2000). Thus, the intervention in this study may have provided enough support to the mothers to reduce the effects of other risk factors and to disrupt the association between ongoing drug use and low maternal responsiveness. However, more research is

needed on the association between a home-based intervention and these other risk factors.

Although one component of the home-visiting protocol was to help the mothers use existing services (Aid to Families with Dependent Children, Medical Assistance, etc.), there were no significant group differences in use of services at 6 months. A high percentage of mothers in both groups reported using existing services, which may be the result of the hospital's policy to register the mother for services before she left the hospital. Control group families were more likely to be involved with Child Protective Services than were intervention group families. However, some caution is warranted because the data were based on maternal report, and we could not access Child Protective Services records to verify who was still involved with the agency.

Finally, infant birth weight was a significant predictor of infant warmth and maternal responsiveness, which means that heavier infant birth weights were associated with higher infant warmth and maternal responsiveness scores. This finding is similar to other research which found that infant birth weight was a significant predictor of maternal behavior (Zahr, 1991) and infant behavior (Spiker et al., 1993) during mother-infant interaction. One possible explanation is that low infant birth weight has been associated with maternal stress (Robson, 1997) and depression (Gennaro, York, & Brooten, 1990; Singer et al., 1999), and both stress and depression are associated with poorer parenting among drug-using women (Kettinger et al., 2000). This finding raises concerns about the well-being of infants who are not healthy and who remain with their drug-using mothers.

The data presented here must be interpreted with caution. First, participants included only families in which the infant was discharged at birth into the mother's care. Drug-exposed infants who are discharged into the care of mothers who continue to use drugs may be at greater risk than drug-exposed infants who are placed with another caregiver. Second, the mothers volunteered to participate in the study; therefore, this group may not be representative of all drug-using mothers but may be representative of those in studies. However, we found no differences between mothers who remained in the study and those who dropped out. Third, ongoing maternal drug use was based on self-report; thus, mothers may have underestimated their drug use. However, maternal report of ongoing drug use was high, with almost half admitting continued cocaine and/or heroin use. The mothers in this study may have felt more comfortable admitting ongoing drug use because of the continuity of the research team, because this investigation was conducted in the context of a special clinic for drug-using women, and because all participants were admitted drug users.

Another limitation is that maternal responsiveness and infant warmth were measured at one point in time,

which may account for the lack of group differences. However, researchers (Black et al., 1996) found that among low-income urban African American families, behavior observed during mother-infant interaction was consistent with behavior measured by three other modalities (observations in the home, children's performance on standardized developmental assessments, and maternal self-report on psychological variables). Finally, the analyses in this study were based on the intention to treat model. Although many mothers accepted the home visits, some mothers were noncompliant with the home visits. This variability in acceptance among drug-using mothers has been found before (Black et al., 1994). Future research needs to examine the differences between mothers who accept the intervention and those who do not.

Ongoing maternal drug use is a major concern. Almost half the mothers in this study continued to abuse cocaine and/or heroin and about two thirds used alcohol. Thus, they continued to live in a drug-using environment. Follow-up research on the impact of prenatal drug exposure has shown very few effects on children's development when standardized tests are used (Azuma & Chasnoff, 1993; Hurt, Malmud, Betancourt, Braitman, et al., 1997; Hurt, Malmud, Betancourt, Brodsky, & Giannetta, 1997). However, some of these investigators have not considered ongoing maternal drug use or the parenting environment (relationship between mother and child). In one of the rare exceptions, researchers found that drug-exposed children living in homes with ongoing drug use had worse cognitive outcomes than drug-exposed children living in drug-free homes (Griffith et al., 1994). Thus, it is important that future investigators consider not only initial drug-using status but also the chronic remitting nature of drug use and design intervention programs that include drug treatment.

In summary, mothers in the control group who continued to use drugs were less responsive to their infants during mother-infant interaction at 6 months postpartum than were control mothers who stopped using drugs. The intervention broke that pattern. Mothers in the intervention group were equally responsive regardless of ongoing drug use. Thus, the intervention may have given the mothers specific skills to interact with their infants. More longitudinal research is needed to determine how to decrease maternal drug use and, given the chronic unremitting nature of drug use, how to develop interventions that promote responsive parenting and interrupt negative aspects of maternal drug use on child rearing.

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Custody of Cocaine-Exposed Newborns: Determinants of Discharge Decisions

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ABSTRACT

Objectives. Maternal cocaine use is a leading grounds for newborn foster placement. This study was initiated to investigate the factors that predict custody status of infants born to substance-abusing women.

Methods. A retrospective cohort design was used to study the correlates of discharge custody decisions for 99 consecutive infants testing positive for cocaine in a public hospital.

Results. The population was 49% Black, 40% Hispanic, and 11% Other or unknown. Custody at discharge was to mothers (38%), other family members (25%), or agency foster care (36%). Placement outside the family was greater when mothers had prior child welfare records, in Blacks vs others, with no prenatal care, and when mothers were younger at their first delivery or older at the index birth. Denial of custody to the mother was higher with prior child welfare involvement, in Blacks, and when the mother did not live in her own home. Both models also controlled for parity, child sex, and birthweight.

Conclusions. Earlier involvement with child welfare authorities, race, and other factors predict continued separation of mothers and children at newborn discharge, suggesting the need to reexamine current policies and practices. (*Am J Public Health*. 1993;83:1726-1729)

Introduction

Substance use in pregnancy is a major social and medical problem, affecting the woman, her new child, and other family members.¹ Because of concern about the ability of drug-using women to care adequately for their children, child protection authorities in many jurisdictions have acted to separate these mothers from their infants after birth.²⁻⁴

In the state of New York, child abuse and neglect laws have been applied in cases in which newborn urine assays have shown evidence of illicit drugs, particularly cocaine or its metabolites. Local child welfare authorities in New York City are delegated the authority to investigate such cases and to decide temporary placement at the newborn's hospital discharge. These decisions are made after input by hospital social work staff and assessment of the family and home environment. Some of these infants are discharged to their mothers or other family members, and some are discharged to foster care agencies for nonfamily placement. On occasion, mothers may voluntarily agree to have their infant placed in foster care. Maternal cocaine use has become the leading grounds for newborn foster placement in New York City. Substance use also contributed to the 29% nationwide increase in foster care between 1986 and 1989.⁵

In New York State, immediate newborn discharge placement is followed by a family court determination of custody and may not represent the long-term location of custody. However, separation of mother and child at this time may have a lasting impact on the mother-infant relationship.⁶ Prior studies have not reported on factors influencing the decision to send a cocaine-exposed newborn home with his or her mother or to foster care placement

with a relative or agency. Also, no previous research has studied the predictors of foster care placement of infants of substance-abusing mothers. Although child welfare policy calls for reunifying separated mothers and children, little information exists on the success of current policies in promoting family cohesion. This study was performed to explore the determinants of newborn discharge custody placement in a cohort of cocaine-exposed infants.

Methods

Subjects

This investigation used a retrospective cohort design. The study sample included all newborns testing positive for cocaine or its metabolite benzoylecgonine by enzyme-immunoassay-technique urine assay⁷ from July 1990 through May 1991 at a public hospital in New York City. During this period, there were 3261 births at the hospital. Cocaine toxicology tests were ordered selectively in newborns with at least one of the following criteria: (1) no documented prenatal care, (2) known maternal history of illicit drug use, (3) maternal or newborn signs or symptoms consistent with drug exposure, or (4) birth outside the hospital. The study period im-

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mediately preceded the implementation of a modified child welfare investigation and placement policy in New York State in June 1991. The new policy eliminated lack of prenatal care and extrahospital births as criteria for newborn toxicology.

Data Collection

Research staff gathered all information by systematic review of maternal and infant medical records using prepared coding forms. The chart reviewers were not aware of the specific goal of this investigation.

Statistical Analysis

Chi-square tests (for categorical variables) and *t* tests (for continuous, normally distributed variables) were used in conducting bivariate comparisons. Ordinal grouped variables were examined with the Kruskal-Wallis one-way analysis of variance. Multiple logistic regression was used to control simultaneously for several independent variables predicting discharge custody status. SAS software was used for all analyses.⁸ Methods described by Schlesselman⁹ were used to determine confidence intervals on multiple logistic odds ratios.

Results

During the study period, 99 infants were identified with positive urine assays for cocaine or benzoylecgonine. Reasons for toxicology testing (not mutually exclusive) were known history of drug use (64), clinical signs of drug use in mother or newborn (6), lack of prenatal care (31), and extramural delivery (11). Custody at newborn discharge (see Table 1) was to birth mothers (38%), other family members (25%), or agency foster care (36%). No differences were noted in reasons for testing between these custody groups.

Mothers who retained their infant's custody at discharge were younger at the index childbirth, although their first deliveries occurred at an older age (both *P*s < .05). Mothers who kept their newborns were also less often Black (*P* < .01). They were more likely to live in their own home and to have fewer previous children and any prenatal care (all *P*s < .05). Education level (high school completion) did not differ by discharge status or ethnicity. Reported history of substance use did not differ in the three custody groups.

Of mothers with previous children, those who retained custody at discharge were less likely to have had previous reporting to the local or state child welfare

TABLE 1—Characteristics of Mothers of 99 Cocaine-Positive Newborns, by Discharge Custody Status

	Discharge Status		
	Mother (n = 38)	Other Relative (n = 25)	Agency (n = 36)
Mean maternal age, y (SD)	26.8 (5.3)	27.2 (4.3)	29.8 (4.6)**
Mean maternal age at first birth, y (SD)	20.4 (3.9)	20.1 (3.2)	18.3 (4.1)**
Ethnicity, no. (%)***			
Hispanic	23 (61)	8 (32)	9 (25)
Black	10 (26)	14 (56)	24 (67)
White	3 (8)	2 (8)	2 (6)
Unknown	2 (5)	1 (4)	1 (3)
Education level, no. (%)			
≥12 y	17 (45)	7 (28)	11 (31)
<12 y	9 (24)	6 (24)	14 (39)
Unknown	12 (32)	12 (48)	11 (31)
Lives in own home, no. (%)**	23 (61)	11 (44)	11 (31)
One or more prenatal visit, no. (%)**	31 (82)	20 (80)	20 (56)
Multiparous, no. (%)**	28 (74)	24 (96)	33 (92)

**t* test: agency vs mother and agency vs relative.
 **Chi-square test.
 ****P* < .05.
 ***P* = .04 (*t* test: agency vs mother).
 ****P* = .01 (chi-square test excluding unknowns).

TABLE 2—Child Welfare History of Mothers of 99 Cocaine-Positive Newborns, by Discharge Custody Status

	Discharge Status		
	Mother (n = 38)	Other Relative (n = 25)	Agency (n = 36)
Prior child welfare record,* no. (%)	5 (13)	18 (72)	27 (75)
No prior record, no. (%)	23 (61)	6 (24)	6 (17)
First child, no. (%)	10 (26)	1 (4)	3 (8)
Prior child placed in foster care,* no. (%)	2 (5)	13 (52)	21 (58)
Prior children in foster care,* median no. (range)	0 (0-2)	1.5 (0-7)	2 (0-9)

*Agency or family foster care.
 ***P* < .0005 (chi-square test comparing groups with previous children).

agency (*P* < .0005; Table 2). Index newborns with prior siblings in agency or family foster care were more likely to have been discharged to nonmaternal care. Among 50 mothers with prior child welfare records (range = 0 to 9 children, median = 2 children per mother), 109 prior children were known to have been placed out of maternal care in the past, and 107 children were placed out of maternal care at the time of the index birth. The number of prior children placed out of maternal care was higher among mothers whose index children were not discharged to their custody (*P* = .095, Kruskal-Wallis test). Newborn characteristics of the study subjects (Table 3) did not differ by discharge custody status.

Two models were used in performing a multiple logistic regression analysis (Table 4): (1) agency (nonfamily) placement vs mother or other relative and (2) nonmaternal placement (relative or agency) vs mother. Independent dichotomous (prior child welfare involvement, Black vs non-Black, no prenatal care, not living in own home, primiparous, and newborn gender) and continuous (maternal age at index and first birth and newborn weight) variables were entered simultaneously in both models.

Previous involvement of the mother with the child welfare agency was the strongest predictor of nonmaternal discharge placement; it was less strongly related to nonfamily placement. Black race

TABLE 3—Neonatal Characteristics of 99 Cocaine-Positive Newborns, by Discharge Custody Status

	Discharge Status			
	Mother (n = 38)	Other Relative (n = 25)	Agency (n = 36)	Total (n = 99)
Female gender, no. (%)	15 (39)	12 (48)	22 (61)	49 (49)
Birthweight <2500 g, no. (%)	10 (26)	6 (25)	11 (31)	27 (27)
Mean birthweight, g (SD)	2865 (486)	2748 (693)	2669 (566)	2784 (572)
Mean birth length, cm (SD)	48.1 (2.9)	48.2 (4.0)	47.2 (3.9)	47.8 (3.5)
Mean birth head circumference, cm (SD)	32.4 (2.5)	32.4 (1.8)	32.6 (2.9)	32.4 (2.5)
Mean gestational age, wk (SD)	38.6 (1.7)	37.3 (3.0)	38.0 (2.3)	38.1 (2.3)

TABLE 4—Predictors of Discharge Custody of 99 Cocaine-Positive Newborns: Multiple Logistic Regression

Independent Variable	Model 1 ^a : Nonfamily Discharge		Model 2 ^b : Nonmaternal Discharge	
	Odds Ratio	95% Confidence Interval	Odds Ratio	95% Confidence Interval
Prior child welfare involvement	1.81	0.85, 3.43	3.74	1.91, 7.34
Black vs non-Black	1.78	0.93, 3.25	2.04	1.08, 3.86
No prenatal care	2.02	1.10, 3.70	1.00	0.54, 2.11
Not living in own home	1.89	0.94, 3.00	2.56	1.25, 5.24
Female child	1.52	0.85, 2.70	1.39	0.73, 2.65
First child	0.50	0.17, 1.43	1.84	0.65, 5.22
Maternal age, y ^c				
At first child	0.76	0.62, 0.93	0.95	0.79, 1.13
At index delivery	1.16	1.03, 1.31	0.97	0.85, 1.11
Newborn weight, g ^d	1.00		1.00	

^aOdds ratio of risk for agency placement vs mother or family, controlling for other variables.
^bOdds ratio of risk for agency or family placement vs mother, controlling for other variables.
^cContinuous independent variable (odds ratio of the change in risk with change of one unit of independent variable in same direction).

was also predictive of discharge away from the mother and less predictive of nonfamily discharge custody. In neither model were any interactions noted between ethnicity and prior child welfare reporting. In addition, lack of prenatal care predicted nonfamily placement, and the mother's lack of her own home was associated with her not gaining custody of her newborn at discharge. Lower age of the mother at first delivery and older age at delivery of the index newborn were also predictive of nonfamily placement.

Discussion

The discharge custody status of newborns known to be cocaine exposed may be influenced by many factors, including

local policies and practices,³ individual differences influencing parenting ability and the home environment, and the availability of a family support network. Some of these placements may have been emergency dispositions prior to final court action and may not necessarily reflect court-ordered custody decisions. Others may have been voluntary placements by mothers hoping for judicial leniency in final custody decisions.

Federal statutes require that, before the placement of a child in foster care, "reasonable efforts" be made to prevent the need for removal and to enable the child to return to his or her home.¹⁰ In New York, state social service statutes call for families to be kept together whenever possible, not to be separated solely

because of poverty, and to be offered services to "maintain and strengthen family life."¹¹ These statutes affirm "the state's first obligation" as assisting "the family with services to prevent its break-up or to reunite it" when the child is separated.^{12,13} Unnecessary protracted foster care "may deprive these children of positive, nurturing family relationships and have deleterious effects on their development."¹⁴ Courts may order agencies to "encourage and strengthen" the parental relationship, including helping parents with "housing, employment, counselling, medical care or psychiatric treatment."^{15,16} Also, courts and parents may agree to a temporary separation from the child with plans to reunite after successful drug treatment.

The role of prior child welfare involvement in increasing the likelihood of removal of subsequent newborns from the home raises questions about compliance with federal and New York State regulations. These statutes explicitly require reasonable efforts for family unification, while early newborn placement may result in long-term separation of children from their birth families. Although repeated removal of newborns from the same addicted mother may reflect her lack of response to drug treatment or other services, it may also indicate the system's failure to individualize assessments and to adequately provide needed services. An overtaxed child welfare system with limited resources may focus on short-term goals of perceived child protection rather than the broader efforts needed to protect children by strengthening and preserving family units.

Reunification of foster children with their birth parents has been supported because (1) the child's well-being is enhanced by continuous caretaking, (2) the birth parents have legal and social priority as permanent caregivers, (3) the child may be psychologically harmed as a result of the separation of foster care, and (4) the state avoids the cost and recruitment of foster parents.¹⁷ But in an era of shrinking resources for family support, limited drug treatment services for women with children,¹⁸ and staff cutbacks, such reunification is more difficult to achieve. In addition, child welfare agencies are under legal pressure to make rapid determinations of newborn custody status.

Families that could be helped are all too often simply written off, as yet another child begins a career of foster placement. In the name of protection, crimes are being committed not only against children but against parents, who are

left without authority or responsibility and whose only remaining power is to create more children.¹⁹

In this context, previous records of reporting to these authorities, rather than triggering assistance in family reconstruction, may become a convenient way to identify mothers "at risk" for subsequent parenting deficiency. Overworked and understaffed child welfare agencies may view prior reports as indicators to separate mother and infant until a court determination is made; however, this approach may not be most beneficial to family preservation. The knowledge of cocaine exposure may itself be influenced by social or racial bias in decision making for drug toxicology testing and reporting.²⁰ Such biases may also have an impact on custody disposition decisions. Furthermore, in a selectively screened population such as ours, newborns with positive cocaine toxicology may differ from the general population of cocaine-exposed newborns at this or other hospitals.

Reasons for ethnic disparity in patterns of newborn custody disposition other than direct bias may pertain. Multi-generational patterns of substance use may differ across ethnic groups. Blacks in the population under study may have had less available extended family support to allow mothers or other family members to retain newborn custody because of the severity of drug addiction, unemployment, homelessness, and premature morbidity and mortality. Access to health and legal services and voluntary foster placement may also vary with ethnicity. Of additional concern in these data are the independent effects of lack of housing and prenatal care on newborn discharge dispositions, since these are important indices of social deprivation. Thus, lack of social resources for housing and accessible health care may predispose to loss of child custody.

The cocaine epidemic of the late 1980s led to an overwhelmed child welfare and foster care system and to a plethora of "boarder babies": newborns housed for weeks and months in hospitals for lack of court-determined discharge placement. As this crisis leveled off, New York state and city social service authorities imple-

mented modified policies concerning neonatal urine toxicology screening (memoranda of June 1991 from the New York State Department of Social Services, the New York City Health and Hospitals Corporation, and the New York City Human Resources Administration-Child Welfare Administration). These changes eliminated lack of prenatal care and extrahospital births as sufficient criteria for newborn toxicology testing. Parental drug use is no longer sufficient to determine child maltreatment, although evidence of such use still triggers a child protective investigation. Time limits were set for family and home investigations after reports to authorities of newborns with positive drug toxicologies. The results of these policy changes are not yet clear.

The medical chart data in this study did not afford complete information to understand fully the determinants of discharge custody decisions. Information was usually lacking on past maternal drug use and treatment, detailed family or home assessments, whether foster placement was voluntary, and specific location of prior foster placements, although child welfare investigators presumably had access to these data. Further research is needed to understand the process of discharge custody decision making in regard to drug-exposed newborns. Prospective evaluation of long-term outcomes of these decisions for children and families needs special attention. In particular, the effects of early separation on mother-infant attachment and maternal self-esteem need elucidation. Most important, studies are needed of interventions to enhance the cohesion and reconstruction of families with substance abuse problems. The societal costs of foster care, family disruption, and untreated chemical dependency are considerable. Removal of the drug-exposed infant from his or her family may not be uniformly beneficial to the child, the family, or society. □

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Alcohol and Drug Disorders among Physically Abusive and Neglectful Parents in a Community-Based Sample

ABSTRACT

Objectives. The purpose of this study was to compare the frequency of substance use disorders and symptoms between adults reporting child physical abuse or neglect and individually matched control subjects in a community sample.

Methods. In a nested case-control study, 169 adults reporting physical abuse of a child and 209 adults reporting neglect of a child from 11 662 individuals successfully interviewed in a probabilistic survey in four communities were individually matched with control subjects drawn from the participants. Case subjects were compared with control subjects on the number of alcohol- or drug-related symptoms and disorder diagnoses as determined by symptoms from the Diagnostic Interview Schedule.

Results. Respondents reporting either physical abuse or neglect of children were much more likely than their matched control subjects to report substance abuse or dependence. These differences persisted after potential confounding variables were controlled for.

Conclusions. Parental substance abuse and dependence, independent of confounding factors, are highly associated with child maltreatment. Inconsistent results in previous studies may have arisen from reliance on referred samples and unstandardized assessment methods. Agencies involved in the care of abused or neglected children and their families should consider incorporating routine substance abuse evaluations with treatment, or referral for treatment, where indicated. (*Am J Public Health*. 1994;84:1586-1590)

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Introduction

Over the past three decades, the number of reports suggesting a relationship between child physical abuse or neglect and substance use by parents has grown.¹ Yet a recent national survey of state child protective services agencies revealed that only 14 states routinely collect information on substance abuse.¹ Estimates of the proportion of confirmed child abuse cases associated with some sort of parental substance abuse problem have varied widely, from 5% to 78%.² Nevertheless, substance abuse has been termed the "dominant characteristic" of families in the child abuse and neglect caseloads of some states.³

Social and environmental factors have been considered primary to the development of both child maltreatment and parental substance abuse. Social class is strongly linked to both reported child maltreatment⁴ and a wide range of mental disorders, including drug and alcohol disorders.^{5,6} Child physical abuse and neglect have been found to be higher by factors of 3.5 and 8.0, respectively, among lower-income families.⁷

Although social and environmental factors have been considered the primary determinants of child abuse and neglect, some authors^{4,8,9} have suggested that parental psychiatric disorder generally, and substance abuse specifically, predisposes to child maltreatment, regardless of social factors. For example, incapacitation or impaired judgment secondary to substance abuse may give rise to child neglect. Similarly, depression has a documented association with child maltreatment.⁹ Likewise, antisocial personality traits are associated with substance abuse and child maltreatment.¹⁰ Finally, abusive parents are widely cited as being socially

isolated,¹¹⁻¹³ and thus prone to drinking or drug use.

Methodological and sampling problems have left unanswered questions about the strength and nature of the relationship between alcohol and drug disorders and child maltreatment, thereby calling into question the value of increasing efforts targeting alcohol or drug abuse in families referred for child abuse or neglect. Studies comparing reported child abusers with their nonabusive counterparts are vulnerable to confounding as a result of the child abuse reporting process, which may disproportionately identify women, people of color, or lower socioeconomic classes. Studies examining rates of child abuse or neglect among clinical populations of substance-abusing parents are subject to similar referral biases.

Moreover, many studies used poorly specified or inconsistent definitions of substance abuse. Often, investigators did not distinguish among substance abuse (a general pattern of maladaptive use with associated social or physical problems), substance dependence (a more specific chronic pattern characterized by a wide

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variety of role impairments, tolerance, withdrawal, and loss of control over use),¹³⁻¹⁵ and a variety of lesser patterns of substance use. Some authors¹² suggested that reports of drinking found among surveys of abusive parents may simply reflect attempts to present a socially acceptable justification for abusive behavior, rather than reflecting the correspondence between child maltreatment and a bona fide diagnosis of addictive disease.

These concerns led some to conclude that the relationship between substance abuse and child maltreatment is minimal at best.¹⁶ Yet we are aware of no studies that examined the epidemiology of alcohol and drug disorders with physical abuse and neglect that used (1) a probability sample from a community population rather than referred cases, (2) a carefully matched control group, and (3) data-analytic procedures able to adjust for potential confounds.

Methods

The National Institute of Mental Health (NIMH) Epidemiological Catchment Area Study was a community-based survey of 18 000 adults in five communities across the United States. The Epidemiological Catchment Area data provided the best estimates of the prevalence of other psychiatric disorders in the community, and they offer a unique opportunity to compare the frequency of substance abuse and dependence between adults who report having abused or neglected children and those not reporting child maltreatment. Adult respondents reporting abusive or neglectful behaviors (case subjects) were individually matched on sociodemographic factors with adult respondents not reporting those behaviors (control subjects). We hypothesized that abusive adults and neglectful adults would have more alcohol and drug disorders and symptoms related to substance abuse than their control subjects.

Sample and Procedures

The Epidemiological Catchment Area program consisted of sample surveys at five research sites: New Haven, Conn; Baltimore, Md; St. Louis, Mo; Durham, NC; and Los Angeles, Calif. The surveys were coordinated by the NIMH program staff and included a probability sample of 4000 noninstitutionalized individuals from each community.

Once an individual was selected for the sample, repeated attempts as neces-

sary were made to interview the individual. Of the individuals sampled, 65% to 80% were successfully interviewed. Participation rates varied minimally by site, race, sex, and age.¹⁷ The survey consisted of a face-to-face structured interview, using the Diagnostic Interview Schedule,¹⁸ to obtain information on sociodemographics, health service use, psychiatric symptoms, and functioning.

Measures

Cases for this study were defined as all adult respondents who answered "yes" to any one of five questions on abusive or neglectful behaviors included in the Diagnostic Interview Schedule. More specifically, a single question in the Schedule inquires about serious physical abuse of a child resulting in bruises, bed days, or medical care. Participants who responded positively on this item were classified as "abusive." One site (New Haven)¹³ did not include this question and was excluded from all analyses.

Four questions inquired about neglectful behaviors, including leaving very young children unattended for extended periods, inadequately feeding or caring for children, or having a health care professional state that children were being neglected. The respondents who reported at least one of these behaviors were classified as "neglectful."

All of the remaining respondents who reported never having had children or never having acted as caretakers for children were then excluded from the potential control group. The abusive adults and the neglectful adults were matched with respondents from the control pool on age (± 5 years), race, gender, site, and socioeconomic status quartile. Socioeconomic status scores were determined from a composite of variables including education, household income, and occupational status. Eleven (3.0%) of the abusive or neglectful adults who could not be matched on race were eliminated from analysis. When more than one potential match was generated for a case, one match was randomly selected from among them.

The other primary variables of interest were alcohol and drug disorders. The Diagnostic Interview Schedule used in this study provided computer-generated diagnostic algorithms to derive lifetime *Diagnostic and Statistical Manual of Mental Disorders*, third edition, alcohol abuse, alcohol dependence, drug abuse, and

drug dependence diagnoses. Subjects meeting these *Diagnostic and Statistical Manual of Mental Disorders* criteria were coded as positive for the relevant diagnoses. Previous work demonstrated the reliability and validity of the Schedule in detection of alcohol and drug disorders.¹⁹ In addition, the number of alcohol disorder symptoms (out of a possible 17) and drug disorder symptoms (out of a possible 8) was calculated for each respondent. Because of the lack of information about the timing of child abuse or neglect behaviors, lifetime prevalence estimates instead of current prevalence estimates are reported for this study.

Because depression²⁰ and social isolation²¹ have been associated with child abuse and neglect, lifetime history of major depressive disorder (yes/no) and social support, defined as use of friends and/or relatives as confidants (yes/no) or use of a social service agency for problems with emotions, nerves, drugs, alcohol, or other mental health problems (yes/no), were coded from the Diagnostic Interview Schedule. Because antisocial personality has been associated with excessive drinking and drug use,²² the presence of antisocial personality was entered in regression models to examine the extent to which substance abuse disorders independently contribute to child physical abuse and neglect.

The number of individuals in a household was included in the regression model to control for the effect of the cluster sampling scheme, which oversampled individuals living alone, and to control for the demonstrated association between family size and child physical abuse and neglect.⁷ Finally, to screen for a general "yes" response set, cases were assessed for the presence or absence of another disorder diagnosed by the Diagnostic Interview Schedule. Panic disorder was chosen because there was no theoretical or empirical evidence to suggest a relationship between panic disorder and child maltreatment.

Analytic Plan

Statistical methods for matched-pairs data were employed. McNemar's test was selected for comparing case subjects with control subjects on categorical variables. The Wilcoxon signed rank test was used for ordinal measures, such as the number of lifetime symptoms related to alcohol or drug disorders.

TABLE 1—Demographic Profile of Case Subjects (Those Admitting Physical Abuse or Neglect of Children) and Control Subjects

	Abuse		Neglect	
	Case Subjects, % (No.)	Control Subjects, % (No.)	Case Subjects, % (No.)	Control Subjects, % (No.)
Age, y^a				
18–24	8.9 (15)	8.3 (14)	17.7 (37)	13.9 (29)
25–44	69.8 (101)	59.2 (100)	51.2 (107)	56.0 (117)
45–64	26.0 (44)	27.2 (46)	20.1 (42)	17.7 (37)
65+	5.3 (9)	5.3 (9)	11.0 (23)	12.4 (26)
Race^a				
White	61.2 (101)	61.2 (101)	37.9 (78)	37.9 (78)
Non-White	38.5 (64)	38.8 (64)	62.1 (128)	62.1 (128)
Marital status				
Married	49.7 (84)	49.7 (84)	32.2 (67)	47.4 (99)
Separated/divorced	29.6 (50)	17.8 (30)	32.7 (68)	15.8 (33)
Widowed	4.1 (7)	19.5 (33)	9.1 (19)	18.7 (39)
Never married	16.6 (28)	13.0 (22)	26.0 (54)	18.2 (38)
Education				
Less than high school	49.1 (52)	50.9 (57)	61.4 (81)	62.0 (93)
High school graduate	50.9 (54)	49.1 (54)	38.7 (51)	38.0 (57)
Socioeconomic quartile^a				
0–25.0	21.9 (37)	21.9 (37)	36.8 (77)	36.8 (77)
25.1–50.0	35.5 (60)	35.5 (60)	33.5 (70)	33.5 (70)
50.1–75.0	31.4 (53)	31.4 (53)	23.9 (50)	23.9 (50)
75.1–100.0	11.2 (19)	11.2 (19)	5.7 (12)	5.7 (12)
Total	44.7 (169)	44.7 (169)	55.3 (209)	55.3 (209)

^aVariable used to match case subjects with control subjects.

TABLE 2—Proportion of Respondents with Lifetime Alcohol or Drug Disorders among Subjects Admitting Physical Abuse or Neglect of Children, Compared with Control Subjects

	Abuse			Neglect		
	Case Subjects, % (No.)	Control Subjects, % (No.)	Odds Ratio ^a	Case Subjects, % (No.)	Control Subjects, % (No.)	Odds Ratio ^a
Any alcohol or drug disorder	40.2 (68)	16.0 (27)***	5.1	56.0 (117)	16.8 (35)***	9.2
Any alcohol disorder	36.1 (60)	13.8 (23)***	4.7	45.8 (92)	15.9 (32)***	5.3
Alcohol abuse	9.0 (15)	3.6 (6)*	2.5	9.5 (19)	5.0 (10)	2.1
Alcohol dependence	27.5 (46)	10.2 (17)***	3.6	36.3 (73)	11.0 (22)***	5.2
Any drug disorder	12.5 (21)	4.8 (8)*	2.9	27.3 (56)	4.4 (9)***	10.4
Drug abuse	3.6 (6)	1.8 (3)	2.5	6.3 (13)	2.0 (4)*	4.0
Drug dependence	8.9 (15)	3.0 (5)*	3.0	21.0 (43)	2.5 (5)***	10.5

^aMatched-pair odds ratio.

* $P \leq .05$; ** $P \leq .01$; *** $P \leq .001$.

Conditional logistic regression for paired data was used to predict group membership (abuse cases vs control group; neglect cases vs control group) on the basis of the

presence or absence of a drug or alcohol disorder, after controlling for depression, number in household, antisocial personality disorder, and social support.

Results

A total of 11 662 of the individuals who were successfully interviewed across the four sites did not deny being parents or acting as a caretaker for children. A total of 169 respondents (1.4%) reported abusive behavior, whereas 209 respondents (1.8%) reported neglectful behavior. Sixteen respondents (0.1%) reported both physically abusive and neglectful behavior. The inclusion of respondents reporting both abusive and neglectful behaviors did not significantly change the findings of the study. Results are presented with these individuals categorized as case subjects for both child abuse and neglect.

Table 1 presents the demographic profile of respondents admitting physical abuse or neglect. The mean age of both abusive and neglectful adults at the time of interview was 40 years. The abusive group was predominantly White (61%) with a high school education (51%) and an average socioeconomic status score of 45 (out of a possible range of 0 to 100), whereas the neglectful group consisted primarily of non-Whites (63%) with less than a high school education (61%) and a lower average socioeconomic status score (38%).

In Table 2, the results of the comparisons between case subjects and control subjects for presence of alcohol or drug disorders are presented. The lifetime prevalence of alcohol or drug disorders among subjects admitting physical abuse or neglect of children is markedly higher than that among their matched control subjects, almost without regard to type of diagnosis considered. Control subjects had prevalence rates similar to those reported among the entire sample of household respondents. Both control groups reported on average less than one alcohol or drug symptom, whereas their respective case counterparts reported substantially higher averages.

Results of the logistic regression for paired data (Table 3) give the estimated odds ratio for child physical abuse or neglect for those with a substance abuse disorder after simultaneously controlling for depressive disorder, number in household, antisocial personality disorder, and social support. Substance abuse or dependence continued to be a significant predictor of both child abuse and neglect. In fact, those adults with an alcohol or drug disorder were 2.7 times more likely to have reported abusive behavior toward children and 4.2 times more likely to have

reported neglectful behavior toward children than were their matched control subjects. Adults living in larger households or with a history of depressive disorder were also significantly more likely to have acted abusively toward children than their matched control subjects. A history of antisocial personality disorder remained a significant predictor of child neglect. Interpretation of this finding should be tempered by the consideration that child-maltreatment items are embedded in the antisocial personality disorder diagnosis, thereby increasing the possibility of finding an association between the disorder and child maltreatment. However, regression models omitting the antisocial personality disorder variable produced results similar to those reported here.

Because of concerns about a positive response set among those adults reporting high rates of symptoms, we examined the frequency of panic disorder across cases. Fewer than 5% of neglectful case subjects and 7% of abusive case subjects reported symptoms sufficient to meet criteria for panic disorder, suggesting that the high rates of substance abuse and dependence found in our study were not the result of a general positive response set. The frequency of panic disorder was slightly lower in control subjects.

Discussion

This is the first controlled study to use a community-based sample with standardized diagnoses and assessments to explore the prevalence of alcohol or drug disorders among physically abusive and neglectful parents and caretakers. Forty percent of the adults reporting physically abusive behavior and 56% of the adults reporting neglectful behavior met criteria for an alcohol or drug disorder during their lifetime. These rates of substance abuse disorders were markedly higher than those found in a control group matched on age, race, gender, socioeconomic status, and site. The physically abusive and neglectful groups were also found to report more drug or alcohol disorder symptoms than their respective control subjects. The contribution of substance abuse disorders to predicting physical abuse or neglect remained significant after controlling for depression, household size, antisocial personality disorder, and social support.

Although the differences noted in this study are highly significant and correspond with anticipated results, it is impor-

TABLE 3—Odds Ratios and 95% Confidence Intervals for Child Abuse and Child Neglect and the Proportions of Case and Control Subjects

	Odds Ratio	95% Confidence Interval	% Case Subjects/ % Control Subjects
Abuse			
No. in household	1.45	1.20, 1.74	3.4/2.5 ^a
Depression	4.03	1.25, 13.01	16.4/6.2
Availability of confidant	2.05	0.92, 4.59	28.1/11.0
Antisocial personality	3.36	0.88, 12.85	14.4/2.1
Substance abuse	2.74	1.20, 6.28	35.6/13.0
Neglect			
No. in household	1.11	0.94, 1.31	3.2/2.83 ^a
Depression	1.80	0.60, 5.43	13.7/7.5
Availability of confidant	1.01	0.48, 2.11	29.5/15.8
Antisocial personality	18.13	2.37, 138.58	26.7/1.4
Substance abuse	4.17	1.81, 9.59	47.3/15.1

^aMean.

tant to underscore some limitations. First, the data are retrospective and do not include information on the temporal sequencing of drug or alcohol disorders and abuse or neglect of children. As a result, no causal inferences can be made. However, heavy users of drugs and alcohol often initiate their use in early adolescence,^{23,24} before becoming parents, suggesting that substance abuse disorders are likely to be established or in process when parenting tasks are first encountered. In this study more than 25% of case parents or caretakers with substance abuse disorders began using alcohol or drugs before age 15. Additionally, it is not possible to ascertain the contribution of drugs or alcohol to *individual* acts of maltreatment. However, it is likely that the impact of drug or alcohol use at a level sufficient to warrant a formal diagnosis probably extends well beyond the immediate effects of use.

Second, the prevalence of abuse and neglect found in these data is similar to the prevalence of abuse found in a Canadian study using the Diagnostic Interview Schedule⁹ and higher than the prevalence garnered from child welfare agencies. However, it is below the generally accepted prevalence of abuse and neglect in the population and is approximately equal to the estimated annual incidence rates found in other studies.¹² A number of factors may account for this result. First, only one respondent per household was interviewed, thereby underestimating the number of children abused or neglected because most children are "exposed" to more than one adult. Sec-

ond, child-maltreatment behaviors are probably minimized or hidden due to the social stigma attached to the problem and are likely to be underestimated by self-report data. However, if social desirability bias or concern about self-incrimination caused some maltreating respondents to be classified as control subjects, the effect on the study should be to reduce observed effect sizes by falsely classifying some abusive or neglectful parents as control subjects. On the other hand, respondents falsely denying both child maltreatment and substance abuse disorders could increase our observed effect size.

Finally, the Diagnostic Interview Schedule does not sample the entire range of child physical-abuse and neglect behaviors. The content of the physical-abuse question suggests that parents were only asked about relatively serious occurrences. Thus, these findings could be consistent with Steele's contention that alcohol abuse is a greater factor among the more severe cases of physical maltreatment.⁸

Although this study cannot conclude a causative relationship, the use of a community sample and matched control subjects suggests that the relationship between parental substance abuse and child maltreatment is robust and cannot easily be dismissed on the basis of referral patterns, social class, or community of residence. It is also unlikely that a generic "yes" response set to psychiatric symptoms by some respondents resulted in the association, as neither case subjects nor control subjects were likely to receive a diagnosis of panic disorder, a condition

with no theoretical or empirical link to child maltreatment. Finally, the results support the hypothesis that depression, antisocial personality disorder, or lack of social support mediates some of the relationship between substance abuse and the types of maltreatment studied.

Our results suggest that parental psychopathology, independent of social ecology, is an important determinant of child maltreatment in many cases. Recognizing substance abuse in maltreating parents may alter treatment and outcomes for families in child welfare services. For example, it is widely accepted that maltreating parents with substance abuse disorders must receive treatment for their disorder before any interventions for maltreatment with the family are likely to be effective.²⁵

Currently, most maltreating families do not receive a specific substance abuse evaluation,^{14,26} and among known substance abusers in one study, fewer than half of the maltreating parents were referred for alcohol or drug treatment.¹⁴ Data from one state reveal that substance abuse was identified as a problem in only 8% of substantiated child abuse or neglect cases, and treatment was provided for only 4%. Child welfare systems will need to carefully examine their child maltreatment case-finding mechanisms and their substance abuse evaluation and treatment programs. □

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