



Prospective multicenter observational study of 260 infants born to 259 opiate-dependent mothers on methadone or high-dose buprenorphine substitution

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Abstract

Specialized prenatal care and substitution programs improve the perinatal prognoses of pregnant drug-abusers and their infants. Although methadone is well documented, little is known about high-dose buprenorphine (HDB). This prospective, multicenter ($n = 35$) observational study included 259 women on maintenance during pregnancy: 39% on methadone and 61% on HDB. Major findings were: 46% of them received good prenatal care; 62% had peridural analgesia; 12.3% delivered prematurely (<37 weeks); mean gestational age, 38.6 weeks; mean birth weight, 2822 g. Three-quarters of the newborns developed neonatal abstinence syndrome (NAS) beginning at a mean age of 40 h, with the mean maximum Lipsitz score of 9.1 at 72 h; half of them were treated, mainly with morphine hydrochloride. No baby died. Newborns were discharged with their mothers (96%) or placed in foster care (4%). Comparing methadone with HDB, respectively, mean age at the maximum Lipsitz score was 81 h versus 66 h ($P = 0.066$). The perinatal medical and social prognoses for these 259 drug addicts and their infants appeared to be improved by specialized prenatal care and was similar for methadone or BHD substitution during pregnancy.

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1. Introduction

The coexistence of pregnancy and drug addiction is a common situation. In France, the estimated number of opiate addicts varies between 150,000 and 300,000; 25–30% of them are women, among which an overwhelming majority is of child-bearing age. At present, pregnant drug addicts in France are, usually polysubstance abusers, and are particularly dependent on opiates: heroin and/or methadone or high-dose buprenorphine (BHD) in the framework of a substitution program or illegal drug trafficking. This opiate use is almost always associated with tobacco use and more-or-less marked consumption of

alcohol and/or marijuana, and/or cocaine or crack, and/or medications, especially benzodiazepines.

The perinatal prognoses for pregnant opiate-dependent women and their infants are clearly improved by specialized management of their addictions, including the prescription of substitution therapy, accompanied by medical–psychological–social support and early monitoring of the pregnancy (Hulse et al., 1997; Kandall et al., 1999; Lejeune et al., 1997a,b; Randal, 1991; Ward et al., 1999).

In their editorial, Ward et al. (1999) noted the beneficial effects of methadone substitution during pregnancy, when the dose is adequate: protection of the fetus against the deleterious effects of sudden opiate-concentration changes; better medical monitoring of the pregnancy; prevention of prematurity and low birth weights; prevention of backsliding to use of heroin and other addictive substances.

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HDB efficacy as substitution therapy, for drug addicts in general, and its good tolerance have been established (Kintz and Marquet, 2000), provided that the recommendations are respected concerning the administration modalities and the prescription of high doses of benzodiazepines.

Although studies on the use of HDB during pregnancy are much rarer than those on methadone, the prognoses of these pregnancies also seem to be improved (Fisher et al., 1998, 2000; Jernite et al., 1999; Johnson et al., 2001, 2003; Lacroix et al., 2004; Lejeune et al., 2001, 2003; Mazurier et al., 1996; Schindler et al., 2003). The neonatal abstinence syndrome (NAS) of infants born to mothers on methadone or HDB can be relatively severe (Jernite et al., 1999; Kandall, 1999), and even more intense on methadone than heroin. Johnson et al. (2003) recently published their review of 21 published reports that included a total of 309 women taking HDB substitution during their pregnancies. They concluded that this treatment was very well tolerated, with few perinatal pathologies, particularly a relatively low rate of prematurity for this setting. The doses given varied widely, from 0.4 to 24 mg/day. NAS, considered to be less severe than under methadone, occurred in 68% of the newborns; 48% of them required treatment for it.

However, because no comparative data were available on the outcome of pregnancies under either substitute, no consensus existed as to which agent should preferentially be prescribed to pregnant addicts. The objective of this study was to compare the perinatal morbidity and NAS of infants born to women taking methadone or HDB during their pregnancies. Recently, a preliminary report of double-blind and double-dummy study, HDB ($n = 9$) versus methadone ($n = 11$) have been published (Jones et al., 2005); no differences were found between the two groups for NAS severity.

Although high-dose buprenorphine (HDB) (Subutex®) was not officially authorized for use during pregnancy in France, the limited number of places in methadone clinics and the less restrictive rules for HDB prescription mean that numerous pregnant drug addicts are currently taking HDB in France.

Certain particularities of the French medical system need to be explained: (1) at the time these data were collected, methadone could only be prescribed by a authorized specialized center, while HDB could also be prescribed by a private practitioner or a hospital; (2) all pregnant women, even those without medical insurance or illegal immigrants, can be followed free-of-charge in public hospitals 'Protection Maternelle et infantile' (Maternal and Child Health Protection Centers); almost all socioeconomically disadvantaged women and/or illegal immigrants obtain medical coverage 'Couverture Maladie Universelle' (Universal Medical Coverage), and 'Aide Médicale Etat' (National Medical Assistance).

2. Materials and methods

2.1. Framework

This prospective study was conducted by GEGA, from 1 October 1998 to 30 September 1999. During the study period, the 35 participating French perinatal centers of public hospitals

included all live births to mothers receiving drug substitution that had started before or during this pregnancy within the framework of a maintenance protocol prescribed by a specialized center or a general practitioner and had been continued until delivery.

The following information was prospectively collected from a questionnaire comprising 210 variables (but all were not used in this study): sociodemographic status of the mother (and the father, when appropriate), her health, obstetrical history and drug dependency, the prenatal monitoring of this pregnancy, the conditions of delivery, the characteristics of the newborn and NAS severity (evaluated in all participating centers, using the Lipsitz score (Lipsitz, 1975), as recommended by the American Academy of Pediatrics (1998)), and the child's destination after discharge from the maternity ward. Treatment of NAS was left to the discretion of the participating centers.

A preliminary analysis of this cohort was published previously (Lejeune et al., 2001).

2.2. Prenatal monitoring

The substitution treatment was accompanied by the profound humanization of the way opiate-dependent pregnant women are viewed by the multidisciplinary therapeutic teams participating in this study. These modifications concerned several points.

2.2.1. Management of the pregnancies as high-risk pregnancies, without stigmatization of drug use

Close and early monitoring of these pregnancies prevented most of the previously frequent perinatal complications, especially severe prematurity. A retrospective inquiry conducted from 1988 to 1993 in the northern part of the Hauts de Seine Department in France (Lejeune et al., 1997a,b) showed that in the absence of structured management of these patients, disastrous socialization results, with only a third of the children being in the custody of their mothers. Analysis of that cohort and the literature (Lejeune et al., 1997a,b; Robins and Mills, 1993) showed that the outcomes for these infants depended essentially on the quality of their environment and pathologies indirectly associated with heroin exposure (prematurity, human immunodeficiency virus (HIV) infection, and the consequence of fetal exposure to alcohol and/or cocaine). Close monitoring of these pregnancies and additional management by specialists can lower the frequency of perinatal complications, such as prematurity, low birth weight, acute fetal distress and HIV transmission (Randal, 1991). Dysfunctional mother–child bonding is due not only to negative interactions between the perturbed mother and a suffering newborn (Bays, 1990; Davis, 1990; Regan et al., 1987) but above all, to poorly adapted management approaches used by the obstetrical–pediatric teams.

2.2.2. Creation of multidisciplinary teams in maternity wards

With the goal of establishing solid bonds between parent and child, and preventing their separation and its consequences on the cognitive and affective development of children living in chaotic family situations, multidisciplinary teams were created comprising obstetricians, midwives, neonatologists,

psychologists, social workers, and specialists in drug addiction; in most of the participating hospitals, mobile management teams for drug addicts were a complement to the maternity ward staff.

2.2.3. Evaluation of dependence on drugs consumed and existence of a major fetal risk

The potential risk for the fetus of sudden withdrawal of illicit drugs (acute fetal distress or even in utero death) upon hospitalization for delivery or complications of the pregnancy was assessed. Prescription of a drug substitute, associated with medical–psychological–social support, has proved highly effective in this setting. It is rarely possible to wean the woman off drugs during pregnancy, but it can be envisaged later, after the establishment of solid mother–child bonding.

2.3. The community–hospital perinatal network

The perinatal network created among in-hospital departments and community facilities for drug abusers has paved the way for confidence to take hold among the addicts and the general practitioners and specialized centers that treat them, and to modify the negative image that the maternity wards had acquired, e.g., places where women were forced to go cold turkey, hardly welcoming, and where the a priori separation from their infants was envisaged. This perinatal network, seconded by the ‘*Protection Maternelle et infantile*’ centers and child psychiatrists, enabled the establishment of at-home support before and after delivery.

All these practical changes, among which drug substitution is but one facet, have profoundly modified the perinatal management of these women and their infants. They have led to much better maternal care for their infants in the Maternity or Neonatology wards, even when confronted with NAS, and resulted in a much lower rate of mother–child separation.

2.4. Population

Two hundred and fifty-nine pregnant women were included: 100 (39%) on methadone and 159 (61%) on HDB. One methadone-maintained mother delivered twins (260 neonates). Their sociodemographics are detailed in Table 1. Despite a selection bias, reflecting acceptance into a drug-substitution program, their social settings remained precarious, with only 33% of these women or their couples being wage earners. However, 61% were living with their partners, 76% had their own lodgings and 92% had health insurance.

On the average, the duration of their active opiate dependency, before the onset of substitution, was 8.1 years. The substitution product had been prescribed by a specialized center for 41% of the women and by a general practitioner for 55%. For 78% of the participants, substitution had been initiated before the ongoing pregnancy. Only two women were followed in a halfway house setting.

At the end of pregnancy, the mean \pm S.D. daily doses of substitution products were: 57 ± 30.4 [range: 10–180] mg of methadone and 5.4 ± 4.5 [range: 0.4–24] mg of HDB.

Forty-nine percent of the 259 women had aborted at least once and 18% had two or more abortions (23% of the 259 women had at least one miscarriage and 6% had suffered two or more). Among the 278 children that had previously been born to these women, 2 had died, 52% of the survivors were living with their mothers, 25% with their fathers or another member of their extended family, and 23% had been placed in foster homes by the *Aide Sociale à l'Enfance* (French Governmental Child Protection Service).

2.5. Statistical analyses

The analysis of the data presented herein was conducted at CESAMES with MODALISA software (KYNOS®). Data

Table 1
Medical–social data for the mothers according to substitution product

Parameter	MTD, <i>n</i> = 100 (39%)	HDB, <i>n</i> = 159 (61%)	Total, <i>n</i> = 259	<i>P</i>
Mean age at this pregnancy (year)	29.2	28.4	28.7	NS
Schooling \leq primary (%)	11	20	16	NS
Foreigner (%)	17	23	20	NS
Wage earner (%)	31	34	33	NS
Mean parity	2.3	2.0	2.1	0.026
Living with partner (%)	51	68	61	0.007
Own lodgings (%)	73	79	76	NS
Health insurance (%)	94	90	92	NS
Age drug abuse started (year)	18.9	20.1	19.6	0.034
Onset–substitution interval (year)	9.2	7.4	8.1	0.01
Substitution before pregnancy (%)	72	82	78	NS
Substitution prescribed (%)				
By a specialized center	74	20	41	0.001
By a general practitioner	25	74	55	0.001
HIV positive (%)	7	6	6	NS
HCV positive (%)	72	58	63	0.07

MTD, methadone; BHD, high-dose buprenorphine; HIV, human immunodeficiency virus; HCV, hepatitis C virus; NS, non-significant.

Table 2
Perinatal data

Parameter	MTD	HDB	Total	P
Pregnant women (n)	100	159	259	
Good prenatal care (%)	42	49	46	NS
Peridural analgesia (%)	66	60	62.5	NS
Emergency cesarean or instrumental vaginal delivery (%)	16	19.5	18	NS
Acute fetal distress (%)	26	28	27	NS
Neonates (n)	101	159	260	
Mean birth weight (g)	2790	2843	2822	NS
Mean gestational age (week)	38.4	38.8	38.6	NS
Prematurity, week of amenorrhea (%)				
<37	16	10	12.3	NS
<33	3	1.9	2.3	NS
Intrauterine growth retardation (%)	38	31	34	NS
Length <10th percentile (%)	46	34	38	NS
Cranial circumference <10th percentile (%)	16	9	12	NS
Mean Apgar at 5 min	9.9	9.8	9.8	NS
Breast-fed (%)	23	21	22	NS
Good mother–child bonding (%)	93	89	89	NS
Discharge with both parents (%)	53	68	62	NS
Foster care (%)	4	3	4	NS

MTD, methadone; HDB, high-dose buprenorphine; NS, non-significant.

obtained from the questionnaires were compared using the chi-square (percentages) or Fisher's exact (means) test, or multivariate analysis as appropriate.

3. Results

3.1. Overall findings

Six percent of the women were HIV seropositive and 63% were hepatitis C virus (HCV) positive. Almost half of the women had benefited from good prenatal monitoring (first consultation before 15 weeks of amenorrhea and the number of visits correct for the gestational age, i.e., seven consultations for a term delivery) (Table 2), with 75% having had at least three ultrasonographies.

The rate of premature delivery was 10% for women with good prenatal care versus 16% for the women with poor prenatal care ($P=0.229$). Poor prenatal care was defined as: first visit after 15 weeks, or less than three ultrasonographies, or less than seven visits for at term deliveries. Poor prenatal care was significantly associated with poverty, poorly accepted pregnancies, late arrival in delivery room, and poor mother–child bonding (Table 3). Concerning the delivery, 62% of the women had received peridural analgesia and 18% underwent an emergency caesarean or an instrumental vaginal delivery.

The mean birth weight was 2822 g and the mean gestational age was 38.6 weeks of amenorrhea, with a prematurity (<37 weeks of amenorrhea) rate of 12.3%, and 2.3% had a gestational age <33 weeks of amenorrhea; 34% of the birth weights, 38% of the lengths, and 12% of the cranial circumferences were below the 10th percentile of Leroy and Lefort curves (French intrauterine growth curves). The mean Apgar score at 5 min was 9.8/10.

The factors associated with prematurity for the entire cohort (Table 4) were: women living alone, maternal age <25 years, resources (the woman's or the couple's) comprised exclusively of governmental aide, multiparity, HIV seropositivity,

Table 3
Factors significantly associated ($P<0.05$) with poor prenatal care

Factor	Poor prenatal care (%)	P
Nationality		
Foreigners	70	0.028
French	49	
Living conditions		
Alone	63	0.029
With partner	47	
Education		
At least primary	77	0.007
Secondary or more	50	
Resources		
None	84	0.001
Assistance	58	
Work	38	
Work		
Unemployed	58	0.05
Working	35	
Pregnancy		
Poorly accepted	80	0.016
Desired	45	
Cervix dilation at delivery room admission		
>7 cm	76	0.01
<4 cm	43	
Mother–child bonding		
Poor	82	0.023
Good	51	

Table 4
Factors significantly associated ($P \leq 0.001$) with prematurity

Factor	Premature birth ($n = 32$)	Term delivery ($n = 227$)	Total ($n = 259$)
Single mother	48	37	39
Age <25 year	29	19	21
Receiving financial assistance	61	58	59
Parity >1	84	56	59
HIV positivity	13	5	6
Methadone	48	37	39
Frequent cocaine use	10	8	9
Benzodiazepines	26	22	22
Poor prenatal care	58	42	44
First consultation >15 week ^a	45	35	36
<3 Ultrasonographies	39	17	20

All values are percentages.

^a Weeks of amenorrhea.

methadone substitution, use of cocaine or benzodiazepines, and poor prenatal care.

For 89% of the babies, mother–child bonding was considered good or excellent by the multidisciplinary therapeutic teams; 22% of the infants were breast-fed.

Minor or more severe (Lipsitz score >3) symptoms of NAS were observed in 78% of the infants, and 31% of the scores were >9 (Table 5). They appeared when the children reached a mean age of 40 h with a mean maximum Lipsitz score of 9.15 at a mean age of 72 h. Among the 200 newborns who developed NAS, 67% received medical treatment (51% for the total population); 72% of treated babies received morphine hydrochloride, 11% paregoric, 8% another morphine derivative, 3% chlorpromazine, 3% phenobarbital, and 0.8% diazepam. Mean duration of treatment was 16.9 days \pm 11.9 (range: 2–69).

Thirty five percent of the infants were transferred to the Department of Neonatology, where they stayed for a mean of 24 days. No baby died. Babies were discharged from the maternity or neonatology ward to the home of both their parents (61%) or to the mother's living accommodations (32%) (10% of whom were lodged in someone else's home, usually an extended family member and 6% to a mother–child center or halfway house). In total, 93% of the infants were discharged with their mothers; only 4% were placed in foster homes by court order.

Table 5
Characteristics of the neonatal abstinence syndrome (NAS)

Characteristic	MTD ($n = 101$)	HDB ($n = 159$)	Total ($n = 260$)	<i>P</i>
Lipsitz score >9 (%)	30	32	31	NS
Mean age of NAS onset (h)	45	37.5	40	NS
Mean maximum Lipsitz score	9.13	9.17	9.15	NS
Mean age at maximum score (h)	80	66	72	0.066
NAS treated (%)	49	52	51	NS
Mean duration of treatment (day)	18	16	17	NS
Newborns transferred to neonatology				
All causes (%)	34	36.5	35	NS
Mean duration of stay (day)	28	23	24	NS
Mean age at recovery of birth weight (day)	13	10	11	0.001

MTD, methadone; BHD, high-dose buprenorphine; NS, non-significant.

3.2. Comparison of characteristics as a function of substitution agent

Hundred (39%) women taking methadone and 159 (61%) taking HDB were compared. Their sociodemographic characteristics (Table 1) did not differ significantly, except for the higher percentage of women on HDB living with their partners and their lower parity.

Drug addiction started significantly earlier and the interval between its onset and the initiation of a substitute was longer for women taking methadone. In contrast, substitution had more frequently been started prior to conception for women taking HDB (82%) than those taking methadone (72%), but this difference was not significant.

Women taking methadone were more often followed in a specialized center (74%) than those prescribed HDB (20%; $P = 0.001$), who were more often followed by a general practitioner (74% versus 25% of those on methadone; $P = 0.001$). Sixteen percent of the women taking HDB injected it intravenously. No significant between-group difference was found for HIV or HCV seropositivity. No between-group difference was found for the associated consumption of other addictive agents, broken down as follows: for the entire group, 16% of the women took heroin, 9% took cocaine, 33% used marijuana, 86% were tobacco smokers, 25% drank alcohol, and 22% took benzodiazepines and/or antidepressants and/or analgesics.

The quality of prenatal care, administration of peridural analgesia, frequencies of difficult deliveries and acute fetal distress (Table 2) did not differ according to the substitution treatment. Generally speaking, the rates obtained were considered favorable. Concerning the newborns (Table 2), no difference according to the substitution group was noted for standard measurements, intrauterine growth retardation, prematurity, Apgar score, percentage breast-fed, or quality of mother–child bonding.

Severe NAS, with a Lipsitz score >9 (Table 4), was recorded at comparable frequencies in the two substitution groups: 30% for methadone versus 32% for HDB. The only trend towards significance was found for the mean age at the time of the maximum Lipsitz score, which was higher for the methadone than the HDB group (respectively, 80 h versus 66 h; $P = 0.066$).

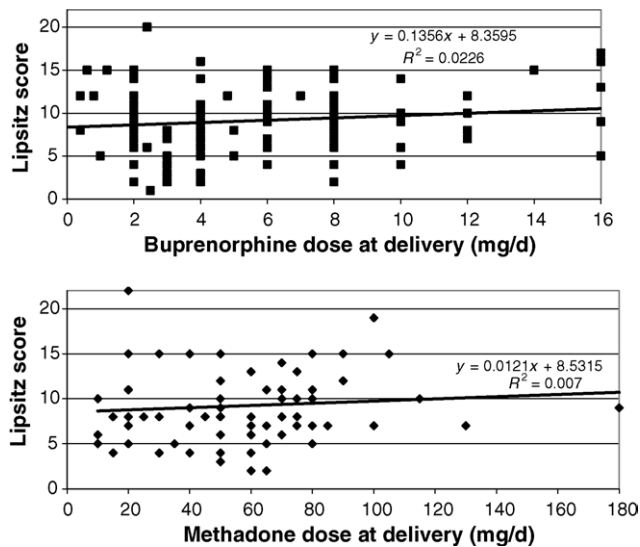


Fig. 1. Maximum Lipsitz score according to the buprenorphine or methadone dose at delivery.

Table 6

Maximum Lipsitz score according to the mean methadone (MTD) or high-dose-buprenorphine (HDB) dose (mg/day) at delivery

Maximum Lipsitz score	Mean dose at delivery (mg/day)	
	MTD	HDB
0	52.7	3.9*
1–4	45.6	4.4
5–9	57.6	5.6
>9	62.8	6.6
Total	56.8	5.4

* $P=0.001$ (Fisher's exact test).

The percentages of infants treated and the mean maximum scores were similar. A statistically non-significant trend was observed for an NAS of later onset and longer duration in infants whose mothers were taking methadone. Transfer rates to the Department of Neonatology were similar for the two groups. However, the mean duration of hospitalization was a little longer for the methadone group, but not significantly so, and can probably be explained by this group's higher rate of prematurity. The mean age for return to birth weight was significantly older for the methadone than the HDB group (13 days versus 10 days; $P=0.001$).

No relationship could be established for methadone or HDB in terms of the dose being taken at the end of pregnancy and NAS intensity, expressed as the maximum Lipsitz score (Fig. 1). The overlapping distributions of the values for each dose rendered impossible individual prediction of NAS severity as a function of the dose. Only the mean HDB dose at delivery was significantly lower when the Lipsitz score was zero versus 1–4, 5–9, or >9 (Table 6); this difference was not found for methadone.

4. Discussion

To the best of our knowledge, this was the first prospective, but not double-blinded or randomized, study to compare the

outcomes of infants born to mothers on methadone or HDB substitution. Although not officially authorized in France for use in pregnant women, HDB is routinely prescribed during pregnancy. This situation is probably explained by the significantly higher rate of HDB use initiated prior to conception than methadone. When substitution is started during a pregnancy, methadone seems to be chosen more frequently, but with differences according to the local accessibility to a methadone program.

Sixteen percent (25/159) of the women on HDB injected the product intravenously (and 4/100 on methadone), which is disturbing in light of the known risks associated with such a practice (Tracqui et al., 1998). An earlier French study obtained a similar rate (15%) for drug addicts taking HDB (Thirion et al., 2000). Comparison of all the data for women injecting HDB and the 134 others taking HDB showed no significant differences, except for slightly more severe NAS: Lipsitz scores of 5–9 and >9, respectively, for 52 and 44% the women injecting HDB versus 34 and 30% for those who did not ($P=0.045$). No significant between-group differences in terms of associated drugs consumed were found. However, this information was self-reported and several studies showed that such claims could differ markedly from real drug use (Harrison, 1997).

The main conclusion derived from the analysis of this cohort was the absence of any major difference between methadone and HDB substitution during pregnancy for the women or their infants in terms of their perinatal prognoses. A finer analysis of the sociodemographic data is currently underway. The only difference observed was slightly more late NAS for the methadone group (mean age at maximum score 80 h for methadone group versus 66 h in the HDB group: $P=0.066$).

The absence of any relationship between the dose of the substitution agent and the severity of NAS confirms the observations of other authors. Kaltenbach (1994) analyzed 147 pregnant woman taking different doses of methadone – 5–40, 41–60, or >60 mg/day – and found no significant difference among these groups in terms of NAS severity, gestational age or birth weight. Brown et al. (1998) also found no significant difference in the frequency of NAS as a function of a methadone dose of <50 (61%) or >50 mg/day (79%) taken by the 32 women they evaluated. Berghella et al. (2003) compared methadone-substitution doses of <80 or ≥ 80 mg/day that had been initiated early during pregnancy and, again, could not demonstrate any significant difference between groups for NAS severity. However, Floch-Tudal et al. (2000) described very different NAS severities experienced by twins born to a mother on methadone.

In contrast, other authors were able to establish such a relationship, for example, Doberczak et al. (1993) studied 25 pregnant women on methadone and showed that the maternal serum methadone concentration at 16-h postpartum was correlated to the maternal dose before delivery, that this concentration was correlated to the infant's serum concentration on day 0, and that the intensity of NAS was correlated with a decline of the infant's serum methadone level between days 0 and 4.

Finally, perhaps the other drugs consumed by the women whose substitution product might be insufficient should be considered: more severe NAS in polysubstance-exposed infants

(Dashe et al., 2002), especially exposure to benzodiazepines (Sutton and Hinderliter, 1990; Wilbourne et al., 2000).

Overall, our population of opiate-dependent women, followed by highly motivated multidisciplinary teams and treated with substitution products during their pregnancies, differs markedly from other cohorts not benefiting from such close monitoring (Lejeune et al., 1997b). Notably, these women received better prenatal care, experienced fewer perinatal complications, especially prematurity, and were separated from their infants less frequently.

Our study has several limitations. Methadone and HDB were not randomly assigned and the two resulting populations could differ. NAS severity was analyzed in the 35 participating centers based on the Lipsitz score but because of the subjective character of this assessment, comparisons should be nuanced. NAS treatment was not standardized, making comparisons of the percentages of infants treated and treatment durations difficult to interpret.

High-dose buprenorphine appears to be a reasonable alternative to methadone substitution for opiate-dependent pregnant women. No major differences were observed between methadone and HDB substitution in terms of perinatal outcome. This prospective, multicenter ($n = 35$) observational study included 259 women on maintenance during pregnancy: 39% on methadone and 61% on HDB. Major findings were: 46% of them received good prenatal care; 12.3% delivered prematurely (<37 weeks); mean gestational age was 38.6 weeks and mean birth weight, 2822 g. Three-quarters of the newborns developed NAS, beginning at a mean age of 40 h of life, with the mean maximum Lipsitz score of 9.1 at 72 h; half of them were treated, mainly with morphine hydrochloride. No baby died. Newborns were discharged with their mothers (96%) or placed in foster care (4%). Comparing methadone versus HDB, respectively: 16% versus 10% of the infants were born prematurely; mean age at the maximum Lipsitz score was 81 h versus 66 h ($P = 0.066$). The perinatal medical and social prognoses for these 259 drug addicts and their 260 infants appeared to be improved by specialized prenatal care and was similar for methadone or BHD substitution during pregnancy. In addition, a recent preliminary report (Jones et al., 2005) “suggests that buprenorphine is not inferior to methadone on outcome measures assessing NAS and maternal and neonatal safety when administered starting in the second trimester of pregnancy”.

In the long and painful path of a woman addicted to opiates, pregnancy clearly seems to be a good time to initiate multidisciplinary management via the community–hospital perinatal network with the aim of improving the long-term prognoses of mother and child.

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