Personal practice

Neonatal opiate withdrawal

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The Problem

With increasing maternal drug abuse, the paediatrician must be ever alert to the possibility that symptoms observed in a young baby might be the consequence of drug withdrawal. The absence of a positive maternal drug history in no way negates this diagnostic possibility. Although opiate withdrawal is the subject of this paper, combinations of drugs are commonly involved and there may sometimes be little certainty concerning the identity of the principal agent causing a given baby's withdrawal symptoms.

Mechanism of opiate withdrawal

Excitation of noradrenergic cells in the locus coeruleus of mammals elicits many of the features of opiate withdrawal. Morphine and clonidine, an α_2 adrenergic agonist, are inhibitory and block both electrical and pharmacological activation of these cells in primates and rats.^{1 2} Chronic exposure to morphine in rats results in the development of an increase in number of brain stem α_2 adrenergic binding sites,³ and it is postulated that the phenomena associated with opiate withdrawal are the consequence of the development of α_2 adrenergic supersensitivity; this can be suppressed by clonidine.

Signs of withdrawal

Behavioural and physical modalities reflecting central and autonomic nervous system dysfunctioning are involved. Features of neonatal abstinence include restlessness and agitation with rub marks, a high pitched cry, sleeplessness, tremulousness, hypertonia, hyperactive stretch and Moro's reflexes, frantic sucking, scratching, impaired feeding with poorly organised sucking, vomiting, diarrhoea, abnormal weight loss and failure to gain weight, yawning, sneezing, nasal snuffles, sweating, temper-

ature instability, tachycardia, hypertension, tachypnoea, opisthotonic posturing, and convulsions.

Some of these signs are observed in many neonatal conditions. Drug withdrawal must be considered, however, as a possible cause when several occur concurrently and in increasing numbers.

Timing of onset of withdrawal

If the fetus has been exposed to several drugs up to the time of birth the onset of symptoms may be variably delayed beyond the usual first three days. Although methadone has been implicated in the late onset of the signs of withdrawal, when appropriately monitored, all reported cases have manifested some signs within the first two weeks; with polydrug exposure a biphasic pattern of withdrawal has been described.⁴ Administration of naloxone at birth is contraindicated as it may precipitate acute withdrawal, which could be fatal.

Diagnosis

This must be by exclusion of other possible disorders and by obtaining a positive history of maternal ingestion. Alternatively, drug or metabolite may be found in maternal blood or urine or in neonatal urine or meconium.⁵

Principles of treatment

Awareness of the drug abuse may have come antenatally from a mother's own admission or from clinical or social evidence. Prospective monitoring of the infant on a special care baby unit will then be possible. The objectives of treatment are the suppression of signs, the avoidance of excessive sedation and of excessive wakefulness, and the provision of sufficient nutrients. It has been suggested that in 30–50% of infants symptoms of withdrawal can be managed conservatively with swaddling, frequent

Figure Score chart for withdrawal signs. The presence of any one feature within any group of the listed observations would result in a total score of 1 for that group of items. The total score possible is therefore 10. Treatment is likely to be required for any score of 6 and over or for convulsions.

munodeficiency virus (HIV) antibody state of the mother should be known before labour, but where the results have been negative in pregnancy, or when they are not known, rapid evaluation is needed on admission of the mother for delivery. This knowledge not only enables precautions to be taken to protect staff and other contacts but enables hepatitis protection to be given to the neonate in the form of specific hyperimmune globulin and active hepatitis B immunisation. Before HIV screening, counselling of the pregnant mother by a trained counsellor about the implications of a positive result is considered essential.

Breast feeding

Although breast feeding has often been discouraged because of the concern of drug ingestion by the infant, we could only find trace amounts of drug in the milk of a group of mothers taking methadone and heroin. In our experience it would be exceptional for large dose intravenous drug abusers to be successful at breast feeding and so we do not dissuade mothers from feeding their infants, although HIV antibody positivity would be a contraindication. Perhaps the greatest danger of drug exposure from breast feeding is in the situation of the mother who is an occasional intravenous abuser, because high drug concentrations in the blood may sedate her and make her less responsive to and appreciative of her baby's needs as well as being reflected in a higher concentration of drug in her breast milk.

Legal provisions for the child at risk

As yet it is not possible to seek protection for a fetus from the juvenile court or by taking wardship proceedings on the basis of the assertion that the fetus is being damaged by the mother's drug abuse. Postnatally, both options have their shortcomings in providing for these children and their families, and the proposed reforms set out in the Review of Child Care Law 1985,⁹ if adopted, may provide for a more flexible approach to their needs. The difficulties arising from the current alternatives have been discussed by Williams.¹⁰

Supervision

Many of the problems of long term family supervision considered recently in connection with children subject to non-accidental injury¹¹ are equally applicable to children raised in drug abusing families, and in spite of apparent cooperation with the authorities, many addicts fail to achieve, or do not desire, a

change in lifestyle, and family supervision cannot be relaxed.

Our own follow up data on families with babies born between 1968 and 1983 show that of 85 babies leaving hospital and traced only 25% were living with both parents, 20% were with their mother, and 12% were with their father. A further 36% were with other relatives, had been adopted or fostered, or were in other placements. Six parents and four children had died. (Williams M J H, Cavanagh S. Personal communication.)

Outcome

Differences between control and drug exposed groups of children have been documented by many investigators and have been the subject of a recent review.¹² Strauss *et al* found them to be more tremulous at a month;¹³ Marcus *et al* have shown patterns of behaviour characteristic of acute phase opiate withdrawal at a similar age.¹⁴ There are considerable difficulties, however, in selecting any comparison 'control' groups. Rosen *et al* found that in a group of methadone exposed children examined at 18 months of age, more had head circumference measurements below the 3rd centile, developmental delays, abnormalities of tone, and poor fine motor coordination.¹⁵ Significantly lower scores on Bayley mental and motor developmental indices were noted.

Although there are minor differences between studies, the overall impression is that these children perform less well, are more active, and display poorer attention than their peers. There are few follow up data on older drug exposed children; such as they are, they point to persisting disadvantage, with behavioural and developmental skill differences.¹

A proposal for management

After an antenatal case conference where information is exchanged, a strategy for the health care of the family during the perinatal period is formulated and the principal family support individuals are identified so that contact, if not previously existing, can be made with the family. The baby, once born, would be monitored for withdrawal symptoms on a special care baby unit for two weeks. If treatment with drugs is necessary to control withdrawal chlorpromazine is begun with a loading dose of 3 mg/kg body weight followed by a total daily maintenance schedule of 3 mg/kg given orally, divided into four or six doses; this dose is increased daily by 3 mg/kg if withdrawal is becoming increasingly severe until control is achieved.

Occasionally, as much as 15 mg/kg each day is required. Once the baby's condition is stable, reduction in chlorpromazine dosage by 2 mg/kg is attempted every third day; monitoring of the degree of withdrawal symptomatology is continued. Excessive weight gain with high feed intakes is often observed in association with control of symptoms being achieved, whereas slowing or stopping of weight gain due to the rise in metabolic rate occurs if uncontrolled opiate withdrawal re-emerges. After stopping treatment with chlorpromazine a further case conference is held where the need for obtaining legal protection for the child is further considered and a plan made for follow up visits after discharge by social workers and health visitors. Before discharge, the baby and mother are cared for together on a transitional care or postnatal ward for a 'rooming in' period of three or more days. A review case conference is held at three months after the first hospital outpatient follow up visit, when decisions are made on the level of involvement deemed necessary and the frequency of subsequent conferences. At any stage, procedures may be set in motion to seek a care order on the child or to obtain wardship. The lifestyle of many of these families makes continued tracing and contact a major collaborative undertaking.

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