Menstrual Function and Pregnancy in Narcotics Addicts treated with Methadone

CHRONIC opiate addiction in women is generally considered to be associated with amenorrhoea, anovulation and infertility[1], but the number of observed pregnancies in drug addicts, as well as case reports of pregnancy in women with chronic addiction[2,3], casts doubt on this belief. The irregular life of these women and the clouded sensorium make it difficult to define the effects of opiates on the hormonal state. A unique opportunity to observe gynaecic function in women maintained on large doses of a narcotic drug under close medical supervision was provided by the methadone maintenance treatment programme[4]. This is a programme for the voluntary rehabilitation of the "hard core" addict. The patients are given gradually increasing doses of methadone to induce a state of tolerance and then are maintained on a constant dose of 60–120 mg/day. It is thought that such large doses induce "narcotic blockade", so that heroin becomes neither necessary nor desirable and the addict can return to a normal, useful life[5].

During the past 2 yr seventy-six women have been admitted to this methadone maintenance treatment programme. While on heroin before starting the programme, fifty of these women stated that they were amenorrhoeic or menstruating infrequently; sixteen stated that their menses were normal. Thirteen women left the programme for various reasons, so that sixty-three women have been observed. Four of these women have had previous hysterectomies and five were post-menopausal, leaving fifty-four women with menstrual function. Forty-three of these women began to menstruate regularly after the institution of methadone maintenance, usually within 1–2 months. Eight women have become pregnant (Table 1).

Table 1. DISTRIBUTION OF PATIENTS

Number of patients originally on the programme	76
Number of patients continuing on the programme	63
Number of previous hysterectomies	4
Number of post-menopausal patients	5
Number of women of childbearing age	54
Number of women who began to menstruate regularly	43
Number of pregnancies	8
Infertility study	1

The women who became pregnant were all between 24 and 36 yr old. All of them were multiparous. Each had previously had one or more living children and several abortions. The interval between the present pregnancy and last previous pregnancy (including abortions) varied from 3 to 9 yr. Pregnancy occurred from 2 to 18 months after the institution of methadone maintenance therapy in seven of the eight patients. In one patient, because of the urgent need for therapy, methadone maintenance was begun when she was 3 months pregnant.

Each of these patients received from 60 to 120 mg of methadone daily, before, during and after the pregnancy. In the beginning, because of the fear of the possible teratogenic effect of methadone, an attempt was made to reduce the dose, but this proved to be unsatisfactory. At present the methadone maintenance dose is continued at the same level as that necessary before pregnancy. The antepartum course on all patients was uneventful with no toxaemia or undue gain in weight. One patient with a positive serology was treated with penicillin.

Of the eight pregnant women, one has not yet been delivered; five delivered normal children—four by easy vaginal delivery and one by repeat caesarean section. One pregnancy ended in abortion, and one in intrapartum death secondary to strangulation by the umbilical cord. Autopsies performed on each foetus disclosed no evidence of congenital malformation, and death could not be related to methadone therapy.

Of the five living children, all had Apgar scores of nine or ten at birth. Four of the babies weighed more than 2,800 g, and one weighed 1,260 g. This is in striking contrast to the low weights at birth of infants delivered to mothers who are actively addicted to heroin. There was minimal evidence of "withdrawal syndrome" in the infants, and no active therapy was required for any child. All went home after observation for 10 days. No congenital abnormalities were noted. The children now range in age from 2 to 12 months, are at home with their families and seem normal in every way.

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Definition and Quantitation in Ecology

AUSTIN[1], in commenting on my communication[2], has provided an example of the problems which arise in justifying a non-quantitative approach to a subject such as ecology. Austin attaches significance to an imprecision of definition in my examination of the relationships among functional properties of Californian grasslands, and concludes "more adequate definitions are necessary before McNaughton's suggestions . . . can profitably be examined". A critical examination of this proposition shows it to be erroneous. A summary of the data required by such an examination is included (Table 1).

Table 1. SUMMARY OF DATA ON CALIFORNIAN GRASSLANDS

Biomass (g/m²)	Productivity (g/m²/yr)	No. of species	d	DI	D	Corrected DI
189	122	16	3·25	52·5	0·518	19·2
216	53	11	2·17	60·6	0·558	37·1
150	92	11	2·17	53·7	0·488	30·2
205	146	13	2·50	67·6	0·639	40·1
399	316	7	1·30	79·8	0·767	64·5
326	306	6	1·08	88·9	0·862	68·4
442	219	11	2·17	63·9	0·661	40·4
257	63	10	1·95	60·7	0·598	39·2

The first point in Austin's criticism is that my definitions are insufficient. An alternative definition widely circulated in the literature and often employed in estimating diversity is Margalef's[3] approximation of biotic diversity

$$d = \frac{S - 1}{\ln N}$$

where S is number of species and N is number of individuals in the sample. All the definitions of diversity in the literature with which I am familiar[4] are some variation of this, relating the number of individuals in the sample to the distribution of individuals among the species. So long as N is constant, as it is in the grassland samples, $d \propto S$, and the regression of d on number of species documents this relationship ($r = 0{\cdot}997$; $0{\cdot}001 > P$). So, although "species number is not usually equated with diversity[1]", there is no reason, in this case, not to do so. As Whittaker has pointed out[5], definitions of diversity such as those of MacArthur[6] incorporating an importance estimate are really expressions of concentration of dominance.

Austin proposes a definition of dominance

$$D = \frac{X \cdot S}{C} - 1$$

$$S - 1$$