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Opiate dependence and pregnancy: 20-year follow-up study

AIMS AND METHOD

This study examined the 20-year outcome of 55 women who were pregnant and using opiates in 1985 and were attending the Drug Treatment Centre and Advisory Board, Dublin. We established outcome across a number of variables, including mortality, psychiatric and physical morbidity, psychosocial functioning, ongoing

drug misuse and outcome of offspring.

RESULTS

At 20-year follow-up 29 women (53%) were deceased. HIV was the commonest cause of death, accounting for 17 deaths (59%). Those who were alive at follow-up displayed high rates of unemployment (84%), illicit substance misuse (74%) and most were dependent on

state-subsidised accommodation (78%).

CLINICAL IMPLICATIONS

Mortality was higher in our group compared with other long-term follow-up samples. These findings suggest that such participants and their offspring require intensive long-term support and treatment.

Drug misuse is associated with significant morbidity and mortality (Hser *et al*, 2001). Poor physical and mental health, unemployment and homelessness are commonly associated with ongoing drug misuse. The drug-using population have higher rates of hepatitis and HIV infection (Broers *et al*, 1998) and untreated opiate use is also associated with major social problems, including a greater degree of illegal income generation and increased need of emergency care facilities (Fischer *et al*, 1999). Long-term follow-up studies of substance misusing groups have shown mortality rates of over 25%, with as few as 20% of patients achieving stable abstinence at 11-year follow-up (Haastrup & Jepsen, 1998). Important factors that determine prognosis include: first drug of misuse; poly-drug misuse; and amount, frequency, duration and route of administration (Sheehan *et al*, 1993).

Less is known about the outcome of pregnant women who use opiates or their offspring. These patients represent an important group as follow-up studies have reported that substance misuse during pregnancy has both short- and long-term implications for mother and child. One study reported that as few as 16% of mothers on methadone maintenance were abstinent prior to delivery (Brown *et al*, 1998). Children born to such individuals have higher rates of low birth weight, anaemia (Boer *et al*, 1994), prematurity (Hulse & O'Neill, 2001), and they have a high risk of experiencing withdrawal symptoms.

We previously reported on the characteristics at first presentation (O'Connor *et al*, 1988) of a group of pregnant women using opiates attending the Drug Treatment

Centre and Advisory Board (DTCB). At entry into the drug rehabilitation programme 80% of the sample was single; 70% had dropped out of school before the age of 14 years, with only 11% passing any formal examinations. All participants were unemployed and used heroin intravenously and almost half the sample used opiates intravenously as their first illicit drug. Given these high levels of morbidity and the relative shortage of research in this area we sought to establish the long-term outcome of women using opiates during pregnancy and their children.

Method

We conducted a 20-year follow-up study of 55 women who were pregnant and using opiates on first assessment in the DTCB in 1985. This urban-based out-patient facility provides specialised assessment and treatment of persons with substance misuse. The study received ethics committee (research) approval and all clients gave verbal consent to study participation.

Our original study (O'Connor *et al*, 1988) reported on the characteristics and progress of a subsample of 45 of the 55 women assessed in 1985, whereas in the present study we examined the outcome of all 55 women attending for methadone maintenance at that time. The DTCB was the only substance misuse clinic in Ireland and therefore we could include all pregnant women using opiates receiving methadone maintenance treatment. The present study is descriptive in nature and does not seek to make statistical comparisons with the



previous study. Our study is a more comprehensive and representative one.

Follow-up assessments were conducted in two phases.

Phase 1

This consisted of a retrospective chart review of all 55 participants. We assessed mortality rate and cause of death, medical history, including HIV status, and lifetime history of a major psychiatric disorder.

Phase 2

We next contacted those participants who were still alive at follow-up. We determined their outcome across the following variables:

- physical morbidity
- psychiatric morbidity
- psychosocial functioning (current social circumstances, marital status, employment status and forensic history)
- use of illicit drugs in the 6 weeks prior to interview as determined by laboratory urinalysis results
- outcome of offspring (index child born to mother).

Follow-up assessments were conducted by means of face-to-face interviews where possible and we contacted general practitioners (GPs), specialist methadone nurses and family members for collateral information. We also obtained details on outcome from the Central Treatment List (an electronic database of all patients on methadone who attend the DTCB and other drug treatment clinics in Ireland).

Results

Phase 1

At 20-year follow-up 26 women (47%) were alive while the remaining 29 women (53%) were deceased. HIV was the commonest cause of death with 17 of these 29 clients (59%) having died as a result of HIV and complications of the illness. Eight participants (28%) died from a general medical illness, which included tuberculosis ($n=1$), Huntington's disease ($n=1$), congestive cardiac failure ($n=1$) and pneumonia ($n=2$). Four (14%) died by suicide, 2 of which were documented drug overdoses. There was no documented cause of death for the remaining 2 participants (7%), however both had liver pathology and one had a lower respiratory tract infection immediately prior to death.

Among all 55 participants, 20 had a documented psychiatric diagnosis, the majority diagnosis being major depression ($n=14$; 26%); 2 (4%) had an anxiety disorder, 2 (4%) had a borderline personality disorder, 1 (2%) had schizophrenia and 1 (2%) had post-traumatic stress disorder; the remaining 35 (62%) had no documented psychiatric diagnosis. In terms of forensic history 36 (66%) had served a custodial sentence at 20-year follow-up.

Next we examined the rates of hepatitis and HIV infection in the sample. Over half the sample had HIV, with 30 participants (55%) testing positive between first presentation and follow-up; 41 (75%) tested positive for hepatitis B and 31 (56%) had hepatitis C.

Phase 2

Among the 26 participants who were alive at 20-year follow-up, 19 (73%) consented to follow-up interview, 1 had immigrated to the UK, 1 had defaulted from a satellite methadone clinic, and follow-up information was not available on the remaining 5 participants. The mean age of the 19 participants was 43.5 years ($s.d.=3.4$).

In terms of demographic details 16 of the 19 (84%) were unemployed, 2 (11%) were in part-time employment and 1 (5%) was in full-time employment. Nine participants (47%) were single, 5 (26%) were in a stable relationship, 2 (11%) were married, 2 (11%) were widowed and 1 (5%) was separated. Fifteen participants (78%) were living in state-subsidised accommodation; 2 (11%) lived in private rented accommodation, and the remaining 2 (11%) were living with relatives. In the 2 months prior to follow-up 9 participants (47%) tested positive for opiates alone on urinalysis, and 14 (74%) tested positive for opiates and at least one other drug of misuse (cocaine, cannabis, ecstasy, amphetamines, benzodiazepines).

We next evaluated the outcome of the offspring of these 19 participants. We found that a high proportion of the offspring had a forensic history, with 7 (37%) having served a custodial sentence; 1 person had been charged with a criminal offence but had not served a custodial sentence. The remaining 11 (58%) had no relevant forensic history. Eight (42%) had a documented history of substance misuse, of whom five (26%) had a history of intravenous drug misuse.

Discussion

The main findings of this study were that a high proportion of participants had died by 20-year follow-up, with HIV and related illness being the main cause of death. Furthermore, surviving participants displayed a high degree of social and psychiatric morbidity and the majority tested positive for opiate or other illicit substance use in the 6 weeks prior to the follow-up interview.

Among individuals using drugs intravenously long-term follow-up studies estimate mortality rates of between 15% at 20-year follow-up (Bargagli *et al*, 2001) and 22% at 33-year follow-up (Rathod *et al*, 2005). The estimated mortality rate among opiate-dependent substance misusers is approximately 1% per year (Rehum *et al*, 2005). Using these figures we would have expected a mortality rate of approximately 20% in our sample, but more than half of our sample had died by follow-up. This high mortality suggests that women using opiates during pregnancy represent a particularly vulnerable and high-risk group with poor outcomes. However, a number of other factors need to be considered. HIV was largely

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undetected in Ireland until the epidemic of opiate use in the early 1980s. In our previous study of 45 pregnant opiate users 46% of the sample was HIV positive (O'Connor *et al*, 1988). At 6-year follow-up 53% of this sample tested HIV positive (Keenan *et al*, 1993). At 20-year follow-up 55% of our sample were HIV positive. It is worth noting that most of the deaths in our study occurred before the advent of antiretroviral therapy and before the institution of harm reduction programmes. Indeed more recent research suggests that HIV prevention campaigns have changed HIV risk-taking behaviour (Broers *et al*, 1998) and with increasing development of services there has been a corresponding improvement in outcome among substance misusers who are infected with HIV (Ghodse *et al*, 1998). The National Disease Surveillance Centre in Ireland reported a 54% decrease in the number of new cases of HIV infection among intravenous drug users between 2000 and 2001 (Cronin & O'Donnell, 2002). This figure reflected increased investment in harm reduction and treatment services. Owing to the major advances in HIV research and drug development over recent years HIV is no longer seen as an imminent death sentence. Furthermore, there are now closer relationships between addiction and infectious disease teams, ensuring better education, follow-up and earlier initiation of appropriate treatment.

A further explanation for poor outcome and high mortality rates among this sample could be the 'gender paradox', which states that the gender that is less likely to be affected by a disorder may demonstrate poorer outcomes than those seen among the gender with the higher prevalence of the disorder. For example, this paradox is evident in suicide, where depression and suicidal ideation are more common in women yet suicide is more common in men (Murphy, 1998). In 2005 approximately two-thirds of clients who attended the DTCB were males and one-third females, and this figure was higher in 1985, when the vast majority of people presenting with heroin dependence at the DTCB were males. Consequently, poor outcome of participants in the present study could be accounted for in part by the low prevalence of female substance misusers over the course of the study. However, to establish this point conclusively we would need a valid comparative group, which was beyond the scope of the present study.

A review of international studies found that 50–90% of intravenous drug users have hepatitis C (Haydon *et al*, 2005). The numbers of those infected with hepatitis C in our study were relatively low (56%) compared with international rates. However, this may be explained by the fact that this study began in 1985 and the virus was not identified until 1998 (Huang & Hu, 2006). Consequently, routine screening for hepatitis C was not available in the early part of this study and it is likely that some cases remained undiagnosed at 20-year follow-up, especially among participants who were discharged from the DTCB.

The present study followed over 20 years a group of women who had used opiates during pregnancy. No previous studies have examined the long-term outcome of this patient group. Our study highlighted the high rates of unemployment and criminal involvement and low rates

of educational attainment in the group. These women might have reflected a more unstable and disordered group who were less likely to avail of healthcare services and whose pregnancy might have been another factor in their risk-taking lifestyle and an indicator of poor outcome. Studies looking at short-term outcome of their offspring showed that mothers who were misusing drugs had a lower number of antenatal visits, shorter pregnancies and babies with a lower birth weight than individuals not using drugs (Giles *et al*, 1989). Similarly, studies have found high rates of substance misuse (10%), conduct disorder (9%) and depression (26%) in the offspring of individuals using drugs (Weissman *et al*, 1999). The children of parents who are opiate dependent are at greater risk of dysfunctional behaviour and require significant attention and intervention from an early age in order to reduce their risk of substance misuse and dependence (Johnson & Leff, 1999). In the present study almost half of the offspring had a history of drug misuse. However, this is likely to underestimate the true rate of their substance misuse as collateral history was obtained from their mothers, who may not have been aware of the true extent of their offspring's drug use. Furthermore, the offspring were 20 years of age and it is likely that not all will have come to the attention of the substance misuse services or their GPs, as many individuals do not present until later into their adult life.

Most women in the present study continued to misuse opiates and other illicit substances during the follow-up period. We also found high rates of unemployment, psychiatric illness and criminal activity among the surviving participants. Opiate addiction is associated with severe health and social consequences with high rates of physical and mental health problems and involvement of the criminal justice system (Hser *et al*, 2001). Our study supports these findings. From our previous study (O'Connor *et al*, 1988) we identified that this group of women using opiates during pregnancy had a number of risk factors associated with poor outcome, including early age of injecting opiates, poor educational attainment and low employment status. Furthermore, many had a forensic history, which suggests they were more likely to engage in risk-taking behaviour. In terms of what is achievable among such individuals previous studies reported that women who are managed in a methadone maintenance programme have an increased chance of availing of services before and after pregnancy. In our previous study (O'Connor *et al*, 1988) the importance of integrating the services of psychiatry, obstetrics and social services into a comprehensive total care plan to meet the short- and long-term needs of mother and baby was highlighted. Over the years the numbers of people dependent on opiates has increased dramatically and addiction services have developed along with this trend. Higher doses of methadone are now being used to stabilise pregnant mothers, liaison nurses work with both addiction and obstetric teams and services are becoming more tailored to the needs of both mother and baby. Giles *et al* (1989) reported that pregnant women managed on methadone in clinics based in an obstetric hospital had an earlier first antenatal visit, a longer



pregnancy and babies with a higher birth weight than women on heroin. Additionally, the inclusion of counselling, medical, psychiatric, employment and family therapy services results in better outcomes (McLellan *et al*, 1993). Consequently, this study supports a multidisciplinary approach to the treatment of drug dependency in women during and after pregnancy and highlights the need for integrated services directed towards mother and child.

Conclusions

Women using opiates during pregnancy had a poor outcome and many continued to display considerable morbidity at 20-year follow-up. The mortality rate was almost three times that of the general drug-using population (Rehum *et al*, 2005) and was many times higher than what would be expected in a non-drug-using population. There are no comparative studies to date specifically examining outcome in the general problem of female drug users with HIV. This study highlighted the high incidence of HIV infection and HIV-related mortality and the high levels of psychological and social morbidity associated with long-term drug addiction. Few participants had established complete abstinence and most displayed polysubstance misuse patterns at follow-up. The poor long-term outcome of the group reflected the shortage of effective treatments and interventions for HIV in the initial stages of the study. The chaotic lifestyle of these women in terms of high levels of unemployment, unstable relationships, young age at onset of opiate misuse and poor level of education also contributed to their poor outcome. Ongoing drug misuse also affected the offspring, as evidenced by their rate of substance misuse and forensic history.

Declaration of interest

None.

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References

- BARGAGLI, A. M., SPORATI, A., DAVOLI, M., *et al* (2001) Mortality among drug users in Rome: an 18 year follow up study 1980–1997. *Addiction*, **96**, 1455–1463.
- BOER, K., SMIT, B. J., VAN HUIS, A. M., *et al* (1994) Substance use in pregnancy: do we care? *Acta Psychiatrica Scandinavica*, **404**, 65–71.
- BROERS, B., JUNET, C., BOURQUIN, M., *et al* (1998) Prevalence and incidence rate of HIV, hepatitis B and C among drug users on methadone maintenance treatment in Geneva between 1988 and 1995. *AIDS*, **12**, 2059–2066.
- BROWN, H. L., BRITTON, K. A., MAHAFFEY, D., *et al* (1998) Methadone maintenance in pregnancy: a reappraisal. *American Journal of Obstetrics and Gynaecology*, **179**, 459–463.
- CRONIN, M. & O'DONNELL, K. (2002) HIV figures from the Republic of Ireland for 2001. *Eurosurveillance Weekly*, **6**, 23.
- FISCHER, B., GILKSMAN, L., REHM, J., *et al* (1999) Comparing opiate users in methadone treatment with untreated opiate users: results of a follow-up study with a Toronto opiate user cohort. *Canadian Journal of Public Health*, **90**, 299–303.
- GHODSE, H., OYEFESO, A. & KILPATRICK, B. (1998) Mortality of Drug Addicts in United Kingdom 1967–1993. *International Journal of Epidemiology*, **27**, 473–478.
- GILES, W., PATTERSON, T., SANDERS, F., *et al* (1989) Outpatient methadone programmes for pregnant heroin using women. *Australian and New Zealand Journal of Obstetrics and Gynaecology*, **29**, 225–229.
- HAASTRUP, S. & JEPSEN, P. W. (1998) Eleven year follow up of 300 young opiate addicts. *Acta Psychiatrica Scandinavica*, **77**, 22–26.
- HAYDON, E., FISCHER, B. & KRAJDEN, M. (2005) Hepatitis C virus infection and illicit drug abuse. *Canadian Centre on Substance Abuse*.
- HSER, Y.-L., HOFFMAN, V. & GRELLA, C. E., *et al* (2001) A 33 year follow-up of narcotic addicts. *Archives of General Psychiatry*, **58**, 503–508.
- HUANG, H., HU, K.-Q., (2006) A Practical Approach to Managing Patients With HCV Infection. *International Journal of Medical Sciences*, **3**, 63–68.
- HULSE, G. K. & O'NEILL, G. (2001) Methadone and the pregnant user: a matter for careful clinical consideration. *Australian and New Zealand Journal of Obstetrics and Gynaecology*, **41**, 329–332.
- JOHNSON, J. C. & LEFF, M. (1999) Children of substance abusers: overview of research findings. *Paediatrics*, **103**, 1085–1099.
- KEENAN, E., DORMAN, A. & O'CONNOR, J. J. (1993) Six year follow up of 45 pregnant opiate users. *Irish Journal of Medical Science*, **162**, 252–255.
- McLELLAN, A. T., ARNDT, I. O., METZGER, D. S., *et al* (1993) The effects of psychosocial services in substance abuse treatment. *JAMA*, **269**, 1995–1996.
- MURPHY, G. E. (1998) Why women are less likely than men to commit suicide. *Comprehensive Psychiatry*, **39**, 165–175.
- O'CONNOR, J. J., STAFFORD-JOHNSON, S. & KELLY, M. G. (1988) A review of the characteristics and treatment progress of 45 pregnant opiate addicts attending the Irish National Drug Advisory and Treatment Centre over a two year period. *Irish Journal of Medical Science*, **157**, 146–147.
- RATHOD, N. H., ADDENBROOKE, W. M. & ROSENBAACH, A. F. (2005) Heroin dependence in an English town: 33-year follow-up. *British Journal of Psychiatry*, **187**, 421–425.
- REHUM, J., FRICK, U., HARTWIG, C., *et al* (2005) Mortality in heroin assisted treatment in Switzerland 1994–2000. *Drug and Alcohol Dependence*, **79**, 137–143.
- SHEEHAN, M., OPPENHEIMER, E. & TAYLOR, C. (1993) Opiate users and the first years after treatment: outcome analysis of the proportion of follow up time spent in abstinence. *Addiction*, **88**, 1679–1689.
- WEISSMAN, M. M., McAVAY, G., GOLDSTEIN, R. B., *et al* (1999) Risk/protective factors among addicted mothers' offspring: a replication study. *American Journal of Drug and Alcohol Abuse*, **25**, 661–679.

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