

Early Intervention Program for Pregnant Heroin Users and Their Young Children: Hong Kong's Experience

P IP, WT CHAN, YT LEE, CB CHOW

Abstract

Objectives: To achieve early identification of pregnant heroin users and their young children and to provide adequate support, modify important risk factors and monitor the welfare of their children. **Methodology:** Pregnant heroin users were identified during early pregnancy by social workers in a major methadone centre in Kowloon West and referred to a district hospital for early assessment, counselling, management of drug addiction and formulation of child care plan. Their infants and young children were followed up and closely monitored by a paediatrician and staff in a local maternity and child health centre. **Results:** Fifty-eight heroin users and their families (69 children) were recruited in the Kowloon West District from May 2006 to April 2007, among which 9 (15.5%) underwent successful detoxification and 38 (65.5%) became stable methadone users, which were significantly higher than the 7% successful detoxification rate and 14% stable methadone user rate found in the baseline study before the program. Vaccination compliance of their young children was 94%, which was higher than the 77% compliance rate found in the surveillance study before the program. **Conclusions:** Modification of risk factors of pregnant heroin abusers and their young children could be achieved by an early intervention program through enhanced work of health care and social service workers.

Key words

Children; Detoxification; Early Intervention; Heroin abuse; Pregnancy

Department of Paediatrics and Adolescent Medicine,
Princess Margaret Hospital, Lai Chi Kok, Kowloon, Hong
Kong, China

P IP (葉柏強) MBBS(HK), MRCP(UK), FHKAM(Paed)
CB Chow (周鎮邦) FHKAM(Paed), FRCPCH,
FRCP(Lond, Glas, Edin)

Hospital Authority Head Office, Hospital Authority, Hong
Kong, China

WT CHAN (陳榮達) MBBS, Dip Fam Med

Methadone Treatment Counselling Program, The Society
for the Aid and Rehabilitation of Drug Abusers, Hong
Kong, China

YT LEE (李欣曾) Master of Social Work(MSW), The University
of Hong Kong

Correspondence to: Dr P IP

Received January 14, 2008

Introduction

Drug abuse is a relatively common problem in pregnancy worldwide.¹⁻³ The public health concern for substance use during pregnancy is reflected in the statement by the US Senate Committee on Appropriations in 1991, which called for monitoring trends and adverse effects of drug abuse on pregnant women.⁴ Drug abuse poses significant health risks to both mother and fetus.^{5,6}

Heroin abuse during pregnancy is associated with 1) fetal growth retardation and neonatal withdrawal syndrome in infants and 2) an increased frequency of abruptio placentae, sexually transmitted diseases, and other complications in mothers.^{7,8} A previous local study in Hong Kong showed that narcotic addiction in pregnant women in the Chinese population was associated with poor antenatal attendance, maternal complications (e.g. higher prevalence of venereal disease and antepartum haemorrhage), higher perinatal

mortality and adverse neonatal outcome (e.g. prematurity, small for gestational age and neonatal withdrawal syndrome).⁹

Comprehensive Child Development Service Program

Comprehensive Child Development Service (CCDS) is a government-funded, community-based program, using Maternal Child Health Centre (MCHC) as a platform to launch services in different pilot districts to enhance early childhood development for children at-risk and to serve their families in need. Sham Shui Po (SSP) district is the first pilot district for implementation of the new CCDS service since late 2005. There are four main components in the CCDS program, including 1) Early identification and holistic care of at-risk children and their families; 2) identification and management of mothers with postnatal depression; 3) identification and referral of children and families for social service intervention by screening in MCHCs; and 4) enhanced referral and feedback system for pre-school children with physical, developmental and behavioural problems. "Early Intervention Program for Pregnant Heroin Users and their young children" was developed in 2006 and became a new program under Component 1.

Under the new integrated program, a multidisciplinary team composed of an obstetrician, midwife, paediatrician, psychiatrist, psychiatric nurse and other health care professionals in MCHC was formed. Different populations with variable risk factors were identified and recruited in different districts in Hong Kong, each of them with different community characteristics. Drug abuse is the one of the most prevalent problems in SSP, a relatively old district in West Kowloon with the highest number of heroin abusers in Hong Kong according to the statistical report of the Hong Kong Society for the Aid & Rehabilitation of Drug Abusers (SARDA) in 2005.

Despite the high prevalence and significant morbidities reported in both pregnant heroin users and their children, there is a lack of scientific studies on the effectiveness of an early intervention program for families of pregnant heroin users in the Chinese population. As a result of the close collaboration amongst health care professionals in the CCDS Team and social service workers including those from Non-Government Organizations (NGO) like SARDA, an Early Intervention Program for heroin-abused pregnant women and their children was implemented in 2006.

Methods

We hypothesised that an Early Intervention Program designed for pregnant heroin users and their young children would be effective in modifying the maternal risk-taking behaviour including increased rate of detoxification, stable methadone-using and improved child health including their compliance to vaccination schedule and regular medical follow-up.

We performed a prospective study on a group of pregnant heroin users and their children less than 5 years old in the Kowloon West district in Hong Kong from May 2006 to April 2007.

In order to understand more about the characteristics, the profile and kind of problems encountered in children of women who were using heroin or methadone, a surveillance study on the health and development of children of these mothers was conducted by paediatricians from the Hospital Authority (HA) in April 2006 in the SSP Methadone Clinic. All clients were recruited on a voluntary basis by SARDA social workers in the SSP methadone clinic. Parents were interviewed and requested to fill out a questionnaire on demographics, child's physical conditions including growth, physical and behavioural problems, developmental milestones and vaccination compliance. Each child was examined by a paediatrician and the development was assessed by clinical assessment and the use of Denver II Developmental Screening Test.

A close working relationship had been established with social workers in SARDA who were responsible for looking after clients in methadone clinics in Hong Kong. As a pilot program, SSP Methadone Clinic, which was located in the underprivileged area in West Kowloon, had been selected as the pilot centre as it served almost 20% of all methadone users in Hong Kong and served as a good representative sample of heroin-abused families in Hong Kong. Under the new initiative, female heroin or methadone users of reproductive age registered in the methadone clinic were closely monitored by the SARDA social worker. New arrangements were made to facilitate pregnancy tests performed in the methadone clinic. Once confirmed pregnant, the women were referred directly to the Obstetric unit of Princess Margaret Hospital (PMH) through an established channel. They would be accompanied by the SARDA social worker that they were familiar with, to attend the hospital clinic, where thorough assessment and counselling would be provided. Those who opted for

discontinuation of pregnancy (after counselling and discussion on the option of offering the unwanted baby for adoption after delivery) had the pregnancy terminated and was advised on methods of safe contraception (e.g. intrauterine contraceptive device [IUCD] insertion), after counselling.

Heroin users who chose to continue with the pregnancy were followed up in PMH through an Integrated Service Program (Appendix 1). More in-depth assessment, close monitoring and adequate support and counselling were offered. They were then referred to a psychiatrist in the Kwai Chung Substance Abuse Clinic for counselling, formulation of detoxification plan, titration of methadone dosage (usually in the second trimester) and management of any mental health problem. The SARDA social worker played an important role during this critical period as they would accompany the client to attend scheduled hospital clinics and assist in checking compliance of the clients to methadone taking and also motivating the client to stop high-risk behaviours. Women were educated on the nutritional needs, hygiene, precautions and preparations for the baby and were encouraged to consider the options for child care and detoxification plans before the delivery.

Their newborns were managed in the neonatal ward in hospital and monitored closely for drug-withdrawal symptoms. Counselling, anticipatory guidance and social support were provided in the perinatal period. Mothers were given guidance in child care and encouraged to receive detoxification and reduce other high-risk behaviours like smoking and drinking. A multidisciplinary case conference was arranged before discharge of the newborn in order to formulate a comprehensive child care plan together with the parents.

After discharge from the hospital, regular home visitation was conducted by a SARDA social worker and peer volunteer counsellor, who would provide counselling and guidance for baby care and monitoring the progress of the baby and the mother. The newborn and his/her parents were followed up by a visiting community paediatrician in the West Kowloon MCHC during the child health and vaccination sessions. Babies and young children less than 5 years old of women who abused heroin not recruited during the antenatal period were also identified by social workers, hospital and MCHC staff and referred to the Community Paediatric clinic at the MCHC. The baby was assessed and closely monitored during the child health visits, during which the parents would be counselled on child-care techniques, handling of child's emotion and management of common infancy problems. Anticipatory guidance was

provided and the parents would be reminded of the needs of a young child at different ages and encouraged to adopt a proactive role in child care and follow strategies to ensure adequate stimulation and promote child development and maternal-infant bonding. Mothers who abused heroin were strongly advised to undergo detoxification and modification of high-risk behaviours for the sake of their babies. Assistance in residential detoxification in institutions and transient support in child care was provided in necessary cases. In addition, the child's welfare and compliance to the vaccination schedule (non-compliance is defined as deferral of vaccinations for over 6 months) and medical check-up were closely monitored with support of the social worker in SARDA and Integrated Family Service Centre (IFSC).

Results

Surveillance Study in SSP Methadone Clinic

Altogether 35 young children (M:F=17:18) of maternal heroin users were recruited in the cross-sectional health and developmental surveillance study performed in the SSP methadone clinic in late April 2006. Among them, 17 (M:F=8:9) were < 2-year-old, 8 (M:F=3:5) were between 2 to 5-year-old, and 10 (M:F=6:4) were between 5 to 8-year-old. Eight (23%) of them failed to complete the vaccination program according to schedule and the vaccination coverage rate was only 77%. Infants and young children were healthier while older children were found to have more problems. The details are in Appendix 2.

Early Intervention Program

During the study period from May 2006 to April 2007, there were altogether 69 children less than 5 years old and their 58 mothers who were heroin users recruited in the Early Intervention Program (EIP). Forth-eight pregnant heroin users were identified during the antenatal period, among whom 12 who did not consider the option of offering their unwanted baby for adoption after delivery opted for termination of their pregnancy and 11 of them had IUCD inserted for contraception. Among the 12 mothers who opted for discontinuation of their pregnancy, 4 of them had children before this pregnancy (2 mothers had one child and 2 mothers had two children). All their 6 children were recruited into the EIP under the group of children recruited after delivery (mother without new antenatal service). Thirty-six women who chose to continue with the pregnancy received support and care in EIP with their babies delivered in hospital and were followed up by a paediatrician

subsequently in the MCHC. In addition, 33 infants and young children of maternal heroin users who were not recruited during pregnancy were referred by MCHC staff, social workers or medical units to visit the community paediatrician's clinic in West Kowloon MCHC. Among the 33 cases, 24 of them were arranged to be followed up at paediatric specialist clinic in the hospital after delivery but 18 of them defaulted (default rate 75%). There were

altogether 69 children recruited, belonging to 58 mothers with heroin use. There were 49 mothers who had one child, 7 mothers who had two children and 2 mothers who had 3 children recruited in the EIP. Service statistics and relevant outcome measures were summarised in Table 1.

Modification of Important Risk Factors

The baseline study performed by SARDA on 29 pregnant

Table 1 Service statistics and relevant outcome measures

Study period	May 2006 - April 2007	
Target group	Pregnant heroin users and their children < 5-year-old	
Program	Early Intervention Program (EIP)	
Total no. of pregnant women recruited during antenatal period	48 (12 with termination of pregnancy)	
No. of babies born	36	
No. of cases recruited after delivery	33	
Details of heroin-abused mothers and their outcomes	58 mothers aged 20 to 38 years; 38 had addicted partner	
Duration in program	6 to 11 months	
Contraception practice		
- Before pregnancy	30 had no contraception; 13 partners use condom improperly or inconsistently; 6 used safety period; 9 partners use condom properly i.e. 15.5% (9/58) with safe contraception	
- After delivery (EIP)	6 agreed for IUCD; 22 partners use condom with proper technique taught; 7 use oral contraceptive pills; 6 receive hormone injection i.e. 70.7% (41/58) with safe contraception	
Smoking reduction (EIP)	49 current smokers – 29 (59.2%) reduced smoking to <50% of the original amount	
Outcome of the child	36 babies with heroin-abused mothers recruited antenatally	33 children recruited after delivery
Age of child	1-12 months	1 month - 5 years
Maturity	5 preterm babies (34-36 wks) (13.9%)	11 preterm babies (32-36 wks) (33.3%)
Small for gestational age (SGA)	8 SGA (22.2%)	10 SGA (30.3%)
Drug abstinence syndrome	32	30
Medical follow-up default	3 out 36 children (8.3%) defaulted	Before recruitment into EIP (24 children with paediatric follow-up arranged): 18 out of 24 children (75%) defaulted After recruitment into EIP: 4 out of 33 children (12.1%) defaulted

Detoxification rate of maternal heroin users – Refer to Appendix 3; Vaccination compliance – Refer to Appendix 4

heroin users in the SSP methadone centre in late 2005 to early 2006 showed that two (7%) of them were successfully detoxified (stopped using both heroin and methadone for >6 months) and four (14%) of them became stable methadone users (stopped using heroin for >6 months). After implementation of the EIP, 9 out of the 58 (15.5%) mothers using heroin underwent detoxification successfully while 38 of them (65.5%) became stable methadone users (Appendix 3). In addition, 65 out of the 69 children (94%) completed the scheduled vaccinations while only four (6%) of them deferred their vaccination schedule for >6 months (Appendix 4).

Case Reports

The case histories of two pregnant heroin users are described below as an illustration of the profile of clients and their management under this program.

Case 1

A 26-year-old unmarried mother had her first baby with her boyfriend. She was a known heroin addict for more than 10 years without her boyfriend's knowledge. She used methadone since 2001 and attended the SSP Methadone clinic since 2004. She practiced no contraception and became pregnant. This was an unplanned but wanted pregnancy. She was first introduced to the EIP by the SARDA social worker at 6 weeks of pregnancy. Upon her consent to join the program, she was accompanied by the social worker to see an obstetrician at PMH for antenatal check-up. The same obstetrician followed her up for most of the antenatal visits and the dose of methadone was carefully reduced from 75 to 50 mg during the second trimester. A baby girl was delivered full-term in PMH and closely monitored for drug abstinence syndrome. The baby was scheduled for follow-up at the West Kowloon MCHC by a community paediatrician, while the mother was admitted to Kwai Chung Hospital for detoxification.

Case 2

A 33-year-old client had her second baby delivered at a maturity of 30 weeks. She was a heroin addict for more than 6 years. She had her first child (an unplanned pregnancy but a wanted baby) with her ex-boyfriend about 2 years before the birth of this child, soon after she had arrived in Hong Kong from the Mainland. She switched from heroin to methadone during her first pregnancy with the advice from a private doctor and attended the methadone clinic in Yaumatei. Without much antenatal support, she delivered a term baby in a hospital in Hong Kong but discharged herself

with the baby as there was miscommunication with the staff about keeping the baby in hospital for observation. She resumed heroin use after the delivery.

She moved to the SSP district after marriage and her husband encouraged her to abstain from drug use when she was pregnant again. She was recruited into the EIP at around 4 months of pregnancy and followed up by SARDA social workers in the SSP Methadone clinic. She had been seen 3 times at the antenatal clinic in PMH before giving birth to a preterm baby at 30 weeks' gestation. The baby was observed in hospital for 8 weeks for drug abstinence syndrome before discharged home. The baby was thriving well and had been followed up by the community paediatrician who also gave anticipatory guidance to the baby's parents. Meanwhile, the mother had successfully undergone detoxification with full support of her husband and was seen regularly in the Substance Abuse Clinic in Kwai Chung Hospital.

Child Protection and Welfare

Child protection seemed to be a very important issue in this high-risk group. Ten out of the 69 children (14.5%) were found to have elements of child abuse or child neglect which warrant the input and close collaboration of Family and Child Protection Service Unit (FCPSU), social workers of IFSC and SARDA, school teacher, police, paediatricians and other medical professionals to formulate welfare plan, arrange close monitoring and ensure proper child care and placement. Among the 10 neglected or abused cases, 7 mothers were active heroin-users and 3 mothers were stable methadone-users. In comparison, there was no child neglect or abuse in families with mothers who were successfully detoxified.

Six (4 with developmental delay) out of the 10 children required placement for further child care: three of them received foster home care, three were placed into an institution because of parental disturbance to the foster homes (in two cases) and unavailable foster home service (in one case). In addition, 3 newborn babies were arranged to be looked after by foster parents upon discharge from the hospital (after delivery) due to lack of a competent caregiver in the family.

Discussion

Surveillance Study in SSP Methadone Clinic

To the best of our knowledge, our study is the first to investigate the physical and developmental problems of

children of maternal heroin users in Hong Kong. With the close collaboration with SARDA and the trust established between SARDA social workers and methadone clinic parent clients, we were able to examine a representative sample of difficult-to-reach group of children in the outreach session in the methadone clinic. With the good attendance and active participation of parents with drug abuse in the activity, we found that these parents were keen to be approached by medical professionals and eager to improve the health and care of their children provided that it was easily accessible and they were able to develop good rapport with the medical staff. Their children were found to be at-risk of having lack of proper preventive care as reflected by a poor compliance to the vaccination schedule (77%), which was far below the >90% coverage rate in children of the general population in Hong Kong.

In addition, the children were found to be in a disadvantageous position with lack of adequate training and negative early environmental influence as reflected by emerging developmental and behavioural problems as their age increased. We found an interesting pattern with problems emerging as this group of children grew up (Appendix 2). Young children are relatively healthy and the detection of their developmental problems at an earlier and milder stage could be more easily handled and improved in most cases. In contrast, without proper care and intervention, older children in the drug-abused families were found to have much more behavioural and developmental problems that were more difficult to tackle. They seemed to mimic the behaviour of their parents with drug abuse, reflecting the importance of environmental influence in the early years of life. Our findings were consistent with the previous study on the developmental outcome of school-age children born to mothers with heroin dependency whereas elder children of maternal heroin abusers were found to have intellectual impairment, learning difficulties and were more likely to have Attention-Deficit-Hyperactivity Disorder.¹⁰

Heroin Abuse in Hong Kong

Although it is difficult to have an exact prevalence of heroin-abusers in Hong Kong due to the expected under-reporting of illicit drug use behaviour, we are able to have a better understanding of the situation through the data collected by the SARDA, which provides counselling and supportive service for heroin-abusers at the 20 methadone clinics scattered in different areas in Hong Kong. As heroin is an expensive drug with high dependence, it had been observed that the majority of heroin-abusers were registered in methadone clinics which provide free treatment service.

According to the local study performed by SARDA in 2005, there were altogether around 9000 clients who abused heroin registered in methadone clinics in Hong Kong, among whom around 1200 (13%) were female while two-third of them were in the reproductive age group (below 40-year-old). Hence it is important to realise that there is a significant proportion of pregnant women with heroin-abuse, which would impose adverse effects on both maternal and child health.¹¹ As 1800 out of the 9000 (20%) heroin-abusers were registered in the major methadone clinic located in SSP, subjects recruited in the EIP should have already covered a representative population in this high-risk category.

Identification of High-risk Cases

Surveillance of illicit drug use is difficult. Urine toxicology screens are expensive and are sensitive only in a specific time frame.¹ Hence it is a difficult task to identify pregnant women with drug abuse as it depends on the client's motivation and the experience and sensitivity of health care workers in order to obtain a reliable history of illicit drug use. Under the new EIP, heroin-abused women could be more easily motivated to seek for health care assistance in early pregnancy. With the support of social workers and better motivation, counselling and more intensive medical support could be offered at a much earlier stage of pregnancy in order to improve the health of both pregnant women and their fetuses.

Early Counselling and Discontinuation of Pregnancy

In the past, female heroin users did not have much alertness to the possibility of getting pregnant, most of the pregnancies were detected or seen at or after late second trimester and proper counselling and care could not be offered in the most critical period of early pregnancy. Through better education provided by SARDA social workers and lectures given by visiting medical professionals in the methadone clinic, female heroin users became more alert about the possibility of getting pregnant even on methadone or heroin and the importance of safe contraception, family planning and early identification of pregnancy. Through the new integrated program, clients with drug abuse and unplanned pregnancy identified in the first or early second trimester could have much earlier counselling and be allowed the option to discontinue the pregnancy with the introduction of safe contraception. In our EIP, 12 out of the 48 clients (25%) referred in the antenatal period chose to have termination of pregnancy with safe contraception (11 had IUCD insertion and 1 had regular hormonal injection) given.

Under the new EIP, pregnant heroin users could be identified at early stages and assessed by specialist obstetric colleagues with close collaboration between social workers and medical professionals in hospital. In addition, those drug abusers with unplanned pregnancy could receive early counselling, be offered a chance to consider discontinuation of pregnancy, and be educated and assisted to choose safe contraception afterwards. Past data shows that previously only 15.5% of the pregnant heroin users had safe contraception before pregnancy. After recruitment into the program, 70.7% of them adopted safe contraceptive measures (Table 1). This new integrated program was designed with an aim to better family planning in this group of high-risk families and avoid unplanned rapid repeated births.

Perinatal Outcome

Heroin-abuse has been well recognised to have consequential adverse perinatal outcomes including prematurity and small for gestational age (SGA).^{7,8} A local study in Hong Kong showed these same complications among pregnancy of heroin abusers: a high prematurity rate of 41% and 27.5% of babies being small for gestational age.⁹ In our cohort of 33 children (born to maternal heroin users) recruited after delivery (no extra service provided in antenatal period), 11 (33.3%) were born premature and 10 (30.3%) were born SGA (Table 1). In contrast, among the 36 pregnant heroin users recruited into EIP during pregnancy, 5 of their babies were born prematurely (13.9%) and 8 of their babies were born SGA (22.2%), reflecting a more favourable outcome when early intervention was introduced (Table 1).

Early Intervention Program

As maternal heroin abuse is a major risk factor in pregnancy and subsequent years of child care in this group of clients, successful modification of this important risk-taking behaviour would be vital to the subsequent life of women who abuse drugs, their children and families. We found that early intervention, proper education and intensive support during pregnancy and subsequent infancy and early childhood period could alter the risk-taking behaviour of mothers who abused heroin and motivate them to undergo detoxification for the sake of their young children. In our cohort, the rate of successful detoxification (cessation of heroin and methadone usage) increased more than twice (from 7% to 15.5%) after implementation of the integrated program. In addition, an even higher percentage of pregnant heroin users quit using heroin and used methadone regularly

as a substitute. The proportion of stable methadone users increased significantly from 14% to 65.5% among the pregnant heroin users. As maternal heroin abuse and its dramatic withdrawal is detrimental to the developing fetus and the health of mothers during pregnancy^{6-7,9} and results in adverse outcomes in the development of infants and children in the subsequent years of life,¹⁰ modification of the heroin-abusing behaviour of the mothers would greatly enhance their health, the growth and development of their young children and the family relationship. We also found that the risk of child neglect or child abuse was much lower in those mothers who were successfully detoxified.

Hong Kong has a well-established childhood vaccination program with the majority of children receiving their vaccinations in the Maternal and Child Health Centres (under the Department of Health) which are located in different districts and provided free immunisation services to all Hong Kong children. A minority of parents choose to have vaccinations for their children in the private medical sector at their own expense. The uptake rate for childhood vaccination in Hong Kong is among the highest in the world.¹² An 2003 epidemiologic study of immunisation coverage for children aged 2 to 5 years old found that 97.8% of children born in Hong Kong were completely immunised.¹³ In spite of the high vaccination coverage rate of Hong Kong children, we found in our baseline surveillance study in the methadone clinic that almost 23% of the young children of maternal heroin users had unsatisfactory vaccination compliance (deferred vaccination for >6 months). As use of MCHC service in Hong Kong is voluntary, the completion of the child's vaccination program is directly correlated with the parents' motivation and awareness of the importance of vaccinations. The target clients of SARDA have been the adult heroin-abusers and methadone-users all along. More attention has been focused on their infants and children under the new EIP. The health and immunisation status of children of mothers who abused heroin were closely monitored by medical professionals and SARDA social workers. If a child under the program was found to default the MCHC appointment arranged for vaccination and health check by the paediatrician, the family would be reminded by phone or by home visitation arranged by the SARDA worker. In difficult situations, the child and family would be accompanied by their designated social worker to attend the clinics scheduled in the MCHCs. The vaccination compliance of this group of young children at-risk has improved significantly (94%) after implementation of the program.

Child Protection and Child Care

The developmental outcome of children born to mothers with heroin abuse seemed to be influenced significantly by the environment they were being brought up in. Previous studies have shown that children raised in foster homes or adopted families have a much better developmental outcome (higher average scores on Bayley and McCarthy Scales) than children raised at home by heroin-addicted mothers (if they did not suffer from any neurological damage).¹⁴ In our cohort, the 3 newborn babies (mothers recruited during the antenatal period) being cared in foster homes or institutions after delivery had satisfactory developmental progress. In addition, the 4 neglected or abused children placed into foster homes (or institutions due to practical difficulties encountered in foster home arrangement) were found to have improved developmental progress after adequate stimulation and training provided in their new caring environment. This suggests that these children are at-high risk of developmental delay if they are left at home with their heroin-addicted parents without proper child care. It is important that child health and social workers ensure that these children receive proper care and adequate stimulation from infancy and young childhood.

Limitations

As the EIP (for pregnant heroin users and their children) under the CCDS only started in 2006, we could only analyse the data and our experience in the first year of service. Due to the limitation of time-frame, we present only the preliminary results on modification of high-risk behaviours of mothers who abused drugs, adoption of better family planning, improvement in child vaccination and our experience in child protection issues. All these changes have shown a positive impact on the subsequent development of the child and his family. The long-term developmental and behavioural outcomes of these children need to be addressed in future studies.

Due to the limitation of resources, many components of the EIP were implemented based on existing limited manpower. Most of the achievements and success relied on the dedication and voluntary work of our staff. In order to maintain the positive effects on further extension of the project, adequate funding and support would be most vital.

Conclusion

Despite various studies in rehabilitation of female heroin users, there is little data on the well-being of their infants

and young children. As giving birth to a new baby and bringing up a young child involves great challenges and changes in the life style of parents, we should regard pregnancy and postnatal period as a golden opportunity to motivate mothers who abuse heroin to receive regular health care and modify their high-risk behaviours.

Modification of risk factors and certain important goals has been shown to be correlated with early identification and appropriate intervention of at-risk pregnant women and their children. Collaboration amongst HA and different service sectors has been enhanced under the new integrated program. With promising results to date, consolidation of the existing services and further extension of the early intervention program to other communities in Hong Kong in a stepwise fashion is recommended.

Acknowledgement

We would like to thank the Society for the Aids and Rehabilitation of Drug Abusers (SARDA) for their full support in the Early Intervention Program, the dedication of the SARDA social workers and their peer counsellors and all the medical colleagues (from Obstetric, Paediatric and Psychiatric Departments) in Hospital Authority and in Maternal and Child Health Centre for their commitment in the challenging work of early identification and support of children and their families at risk.

References

1. Ebrahim SH, Gfroerer J. Pregnancy-related substance use in the United States during 1996-1998. *Obstet Gynecol* 2003;101:374-9.
2. Gomby DS, Shiono PH. Estimating the Number of Substance-Exposed Infants. *The Future of Children*, Vol. 1, No. 1, Drug Exposed Infants 1991;1:17-25.
3. Schwartz RH. Adolescent heroin use: a review. *Pediatrics* 1998;102:1461-6.
4. US Senate Committee on Appropriations. Report to accompany HR.5257. Senate report 101-516. Washington: US Government Printing Office, 1990.
5. Mawhinney S, Ashe RG, Lowry J. Substance abuse in pregnancy: opioid substitution in a northern Ireland maternity unit. *Ulster Med J* 2006;75:187-91.
6. Thaitumyanon P, Limpongsanurak S, Praisuwanna P, Punnahitanon S. Perinatal effects of amphetamine and heroin use during pregnancy on the mother and infant. *J Med Assoc Thai* 2005;88:1506-13.
7. Little BB, Snell LM, Knoll KA, Ghali FE, Rosenfeld CR, Gant NF. Heroin abuse during pregnancy: effects on perinatal outcome and early childhood growth. *Am J Hum Biol* 1999;3:463-8.

8. Klenka HM. Babies born in a district general hospital to mothers taking heroin. *Br Med J (Clin Res Ed)* 1986;293:745-6.

9. Lam SK, To WK, Duthie SJ, Ma HK. Narcotic addiction in pregnancy with adverse maternal and perinatal outcome. *Aust N Z J Obstet Gynaecol* 1992;32:216-21.

10. Ornoy A, Segal J, Bar-Hamburger R, Greenbaum C. Developmental outcome of school-age children born to mothers with heroin dependency: importance of environmental factors. *Dev Med Child Neurol* 2001;43:668-75.

11. Ostrea EM Jr, Ostrea AR, Simpson PM. Mortality within the first 2 years in infants exposed to cocaine, opiate, or cannabinoid during gestation. *Pediatrics* 1997;100:79-83.

12. Lo WL. The prevention of communicable diseases in Hong Kong. *Hong Kong Med J* 1998;4:419-22.

13. Tse WKM, Yeung SWT. Immunization Coverage Among Children Aged Two to Five: An Update. *Public Health & Epidemiology Bulletin*. Hong Kong: Department of Health, 2004;13:15.

14. Ornoy A, Michailevskaya V, Lukashov I, Bar-Hamburger R, Harel S. The developmental outcome of children born to heroin-dependent mothers, raised at home or adopted. *Child Abuse Negl* 1996;20:385-96.

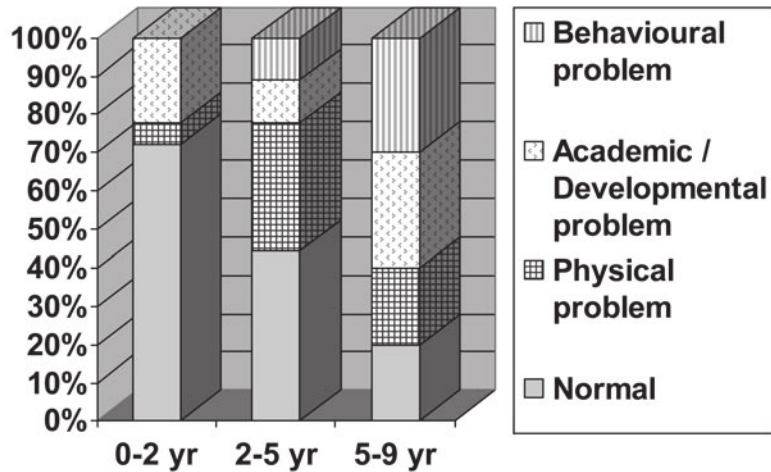
Appendix 1 Early Intervention Program with SARDA

Stages	Service flow	Medical professionals	SARDA social worker
1. Case recruitment	<ul style="list-style-type: none"> • Self approaching; • Recruited by methadone clinic or other social service agencies • Referred by hospital & MCHC 		<ul style="list-style-type: none"> • Arrange an interview with the pregnant methadone patient
2. Initial assessment	<ul style="list-style-type: none"> • The methadone clinic doctor and social worker arrange interviews with the pregnant client 	<ul style="list-style-type: none"> • Confirm the patient's pregnancy and refer to Obstetric unit 	<ul style="list-style-type: none"> • Obtain the patient's consent and conduct an initial assessment
3. First trimester	<ul style="list-style-type: none"> • Counsel on impact of drugs on mother and infant • Counsel on the methadone treatment • Assessed by PMH O&G and discuss on pregnancy plan • Those opted to discontinue with pregnancy would receive detailed counselling and advice on safe contraception • Those decided to keep baby would receive intensive support and continuous medical advice 		<ul style="list-style-type: none"> • Social worker has to fax the referral letter to hospital regardless the patient decides to continue or terminate the pregnancy; • Accompany the patient to have her first medical check-up in hospital
4. Second trimester--- In-depth assessment	<p>In-depth assessment:</p> <ul style="list-style-type: none"> • SW to arrange an interview with the pregnant methadone patient once every two weeks for assessment of the following problems: <ol style="list-style-type: none"> 1. heroin and other substance abuse 2. financial situation 3. family relationship 4. emotional & mental status • Encourage client to receive individual and group counselling 	<ul style="list-style-type: none"> • Arrange detailed assessment and provide necessary counselling, education and support. • Prepare pregnant women on the subsequent course of pregnancy and problems encountered during perinatal period 	<ul style="list-style-type: none"> • Arrange an interview with the pregnant methadone patient once every two weeks • Encourage the pregnant methadone patient to seek early antenatal care and regular follow up and attend antenatal class • Methadone female mutual support group; • Health talks for methadone female; • Methadone treatment educational talks; • Childcare educational talks for methadone users

Appendix 1 Early Intervention Program with SARDA (con't)

Stages	Service flow	Medical professionals	SARDA social worker
5. Second trimester--- Referral services	<ul style="list-style-type: none"> • Refer to substance abuse clinic of psychiatric unit for assessment, dosage titration and formulation of detoxification plan • Refer to psychiatrist for management of any mental health problems • Refer client to IFSC social workers for housing and financial support 		<ul style="list-style-type: none"> • Encourage the patient to receive methadone treatment; • Refer to other residential treatment services, e.g. Kwai Chung Hospital • Refer to Social Welfare Department and other relevant social service agencies
6. Third trimester	<ul style="list-style-type: none"> • The social worker and the female peer counsellor arrange a home-visit 4 to 8 weeks before delivery; • Discuss family planning and use of safe contraception 		<ul style="list-style-type: none"> • Provide nutrients and other materials; • Peer counsellor shares her experience in taking methadone; • Assess home environment; • Assess client's attitude and adjustment to motherhood; • Involve significant others of the mother and or putative father for child care arrangement
7. Case conference before delivery	During the 30-32 weeks of pregnancy, a case conference with paediatrician, psychiatrist, obstetrician, medical social worker SARDA social worker should be held with participation of the mother who abused heroin and her family members		<ul style="list-style-type: none"> • Discuss the patient's situation and the welfare of the baby; • Work out preliminary childcare plan by the professional team (under mother's care/under relatives' care/sign off).
8. Hospitalisation	<ul style="list-style-type: none"> • The social worker accompanies the patient to visit the baby • Formulate discharge plan 	<ul style="list-style-type: none"> • In-patient monitoring and management of baby's drug withdrawal syndrome • Arrange postpartum detoxification service for pregnant women 	<ul style="list-style-type: none"> • Discuss with the patient the discharge plan and childcare plan
9. Case Conference after case delivery	<ul style="list-style-type: none"> • Arrange multidisciplinary conference and formulate a comprehensive child care plan 		<ul style="list-style-type: none"> • Discuss about the infant's welfare plan • Formulate discharge plan by the professional team (under mother's care/under relatives' care/sign off)
10. Returning home (within the first four weeks)	<ul style="list-style-type: none"> • Close monitoring of baby's condition with support of SW and peer counsellor • Provide in-depth assessment and monitoring of baby in MCHC • Motivate mother to undergo or continue with detoxification • Educate parents on child care techniques, ways of handling of the emotion and management of common infancy problems • Counsel parents on the developmental need of baby at different age and encourage them to practice strategies of stimulation to promote baby's development and maternal-infant bonding • Provide anticipatory guidance and close monitoring of the growth, development and welfare of child 		<ul style="list-style-type: none"> • The peer counsellor shares her experience in childcare • Providing nutrients and other materials • Facilitate the client to stabilise on Methadone Treatment Program and further detoxification plan • Sort out which mode of drug treatment is most suitable for the patient e.g. out-patient methadone treatment or residential treatment; • Encourage client and accompany her to bring her infant to attend the medical appointments

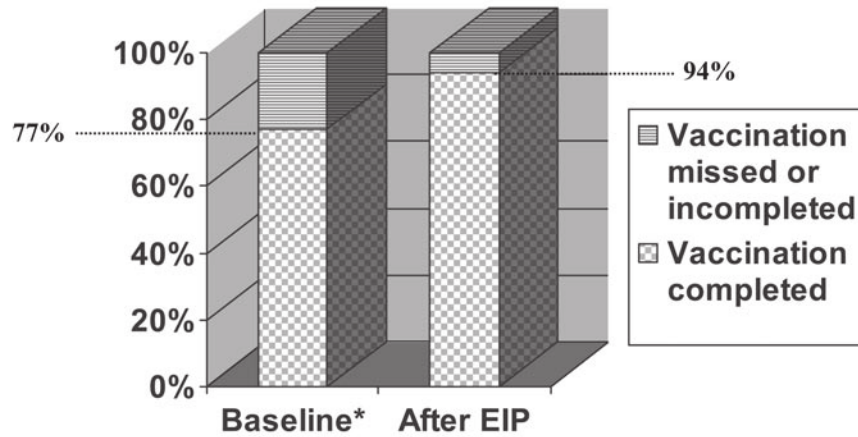
Appendix 2 Major problems in children of maternal heroin users (found in baseline surveillance study in SSP methadone clinic)



Appendix 3 Detoxification rate and use of heroin and methadone in baseline SARDA study and after Early Intervention Program

	Heroin user	Stable methadone user	Successfully detoxified
Baseline study (data from study performed on different sample set by SARDA in 2005)	79%	14%	7%
After Early Intervention Program	19%	65.5%	15.5%

Appendix 4 Compliance of vaccination of children of mothers who abused heroin in baseline surveillance study* and after Early Intervention Program



*Data from surveillance study on 33 children in SSP methadone clinic in April 2006